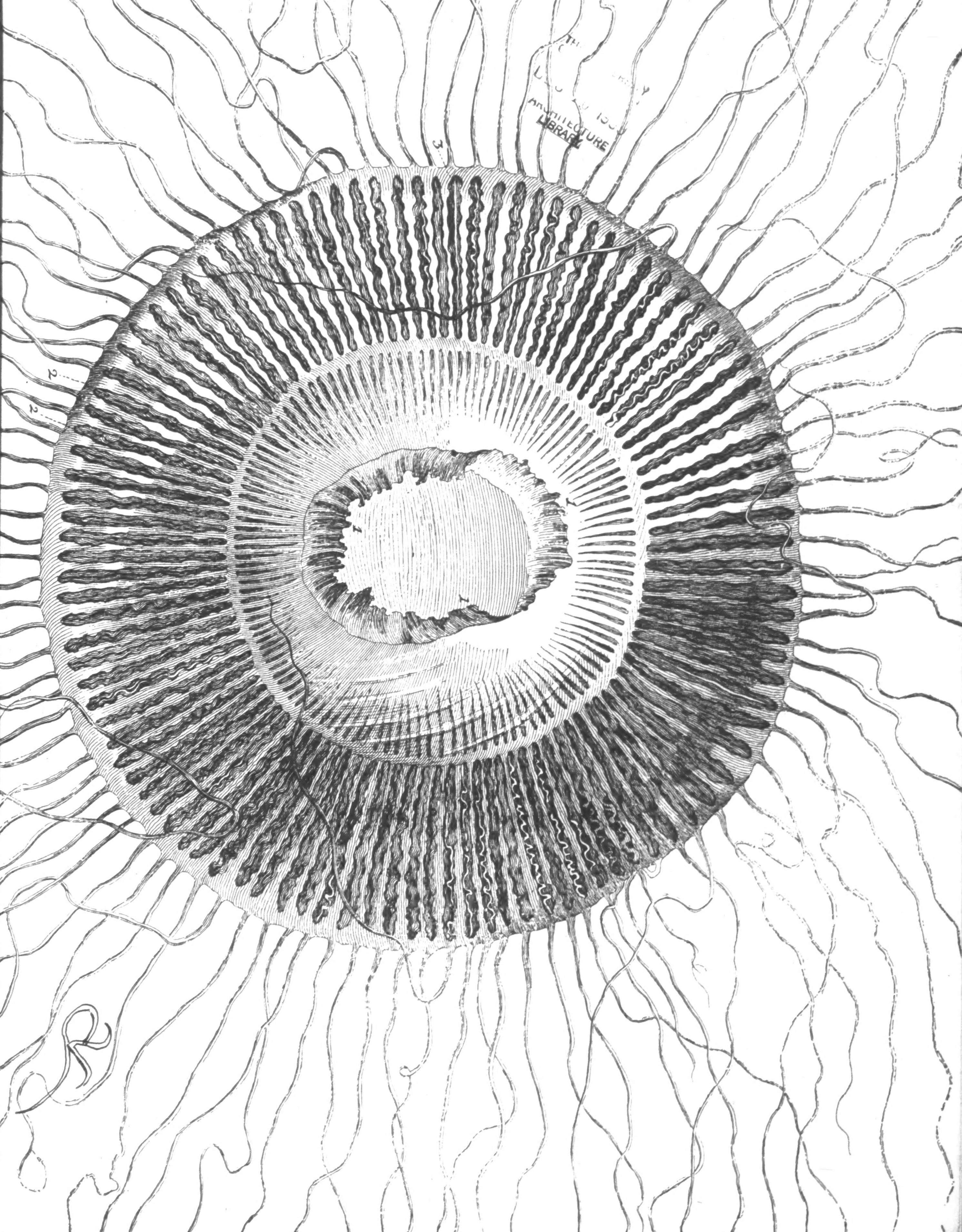
THE ARCHITECTURAL REVIEW VOLUME CXXVI NUMBER 754 DECEMBER 1959 FIVE SHILLINGS



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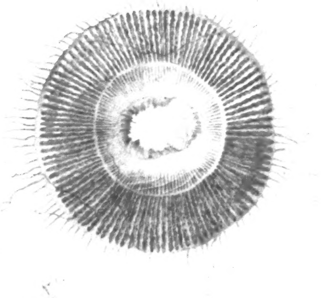


The cover reproduces, slightly larger than the original, plate *XXX*, *Medusa Octostyla*, from the *Icones Rerum Naturalium* (1776) of Petrus Forsskal. Although he died at the early age of thirty-one, Forsskal was one of the outstanding pupils of Linnaeus, and the posthumous books based on his researches are considered to be classics of the systematic literature of Natural History. Such systematic studies, and the speculative hypotheses based on them in the late eighteenth century, were the foundations of the new science of biology whose profound and various influence on architectural thought is discussed by Peter Collins in an article on pp. 303-305, to honour the centenary of the most influential biological work of all, *The Origin of Species*.

SUBSCRIPTION RATE: The annual post free subscription rate, payable in advance, is £3 3s. 0d. sterling, in U.S.A. and Canada $10.50, in Italy Lire 6940, elsewhere abroad £3 10s. 0d. Italian subscription agents: A. Salto, Via Santo Spirito 14, Milano; Librerie Dedalo, Via Barberini 75-77, Roma. An index is issued half-yearly and is published as a supplement to the REVIEW.

THE ARCHITECTURAL REVIEW
9-13 Queen Anne's Gate, Westminster, SW1
Whitehall 0611 Five Shillings

Volume 126 Number 754 December 1959

BOOK REVIEWS

After Roman, Before Gothic

CAROLINGIAN AND ROMANESQUE ARCHITECTURE 800-1200. *By Kenneth John Conant. Penguin Books (The Pelican History of Art)*, 1959. 70s.

The western world saw two great periods of architectural invention (before the modernism of our own time), the Classical, and the Gothic. The former, created by Greeks, was codified by Rome and exported throughout the Empire; the origins of the latter still have elements of mystery. It is in probing this mystery that many students are drawn to investigate the middle of the sandwich: what came between, the running-down of the Roman style and the various importations which prolonged its life. For in spite of great changes the buildings of the period that closed in the twelfth century A.D. are a continuation of the story of Roman architecture, and are rightly termed Romanesque.

It was during this period that there arose the administrative and technical methods that were to characterize also the later, Gothic, Middle Ages, and for that reason if for no other an adequate assessment of the Romanesque achievement has long been needed. In the work now under review, Professor Conant has admirably summed up the mighty works covered by a field of study which he has made specially his own. The book is a notable contribution to scholarship, written in clear, readable English. Its text abounds in pithy passages: 'The practical working systems which produce a building are more important than literary-minded critics suspect' (page 57); the Hungarian invasions of 937 and 955 'stirred the Burgundians to undertake fireproof vaulted construction' (page 80); 'Cluniac psalmody . . . was most beautiful when sung in vaulted churches. Thence, a general stimulus for vaulting' (page 109).

The author's very wide travels before the war of 1939-45 have enabled him to note at first-hand much that is now lost, while more recent discoveries are reported down to c. 1954, the date of the Foreword. The difficulties of compilation and publication at the present day are emphasized by the subsequent lapse of time, and by references such as that to Poblet as still 'desolate' (page 132), whereas it was handed back to the Cistercians in 1940. The traditional date of 1063 is still accepted without comment for the design of Pisa Cathedral by Buschetus (page 232), though recent opinion prefers c. 1089. Other minor criticisms are that the less known place-names are inadequately identified in the text and index, though most of them can be found on the

admirable series of maps; and that some unfamiliar terms are introduced without benefit of glossary (e.g. 'rat-tail' for toothing, pages 119, 308).

Detailed commentary on this most important study is here impossible, but some of its illuminating generalizations must be mentioned. Professor Conant rightly stresses the fact that until c. 1050 the technique of the Rhineland was substantially ahead of that of France, while the great 'colonial' expansion of French Romanesque to England and Spain led to further remarkable improvements (the cross-sectional area of the supports at Santiago de Compostela is only about one-quarter of that at St.-Bénigne, Dijon). The author's intimate knowledge of Cluny has yielded a clear statement regarding modular systems of planning and design (page 116 and pages 306–7), where the symbolic systems of Pythagoras, Plato, and Isidore of Seville are convincingly demonstrated as in actual mediaeval use.

It should be added that the choice and reproduction of illustrations (a number from Professor Conant's own very fine drawings) in this volume more than maintain the high standard set by this notable series.

John Harvey

The Technological Eye

THE NEW LANDSCAPE IN ART AND SCIENCE. *By Professor G. Kepes. Paul Theobold & Co. Chicago. $15.50.*

This is easily one of the most fascinating and stimulating books to come from the United States since the war. It is difficult to do it justice in a few words or even by selecting a few of its 453 illustrations.

The author's premise is that technical and scientific progress has given such added potential widths and depths to our vision that a new world has been discovered, hitherto unknown and unseen, except perhaps intuitively by the painter or the sculptor. Exploration of this vision is going on independently by specialists in different directions. The exhibition at the MIT from which the illustrations in the book are taken was the first attempt to show examples of these varied visual experiences in juxtaposition; 'The discovery of this new landscape is a challenge to correlate all this material to form a new integrated vision through the rational understanding of the world (the knowledge frozen in words and quantities) and the emotional (the knowledge vested in sensory images and feelings).' The electronic microscope can show us matter the size of a thumbnail enlarged to the distance between New York and London, and the radio telescope can make things visible in outer space, which at best could only be guessed at hitherto; the radiograph makes us see into and across matter, spectral stress patterns can be photographed projecting movement in time into diagrams, signals can be translated into pictures and vice versa. The extraordinary thing is how almost identical patterns and images are perceived by the astronomer looking through the radio telescope into space, by the scientist through the electronic microscope into molecular matter and, most curious of all, by the artist—usually consciously quite unaware of scientific and technical vision. However, to see side by side the graph of the movement of a pendulum, a sculpture by Gabo, a diagram of sound waves, an x-ray defraction pattern of a crystal, or cosmic ray showers, together with an abstract painting, proves that somehow there must be a higher order which imposes such common denominators on such heterogeneous phenomena.

Professor Kepes having introduced the problem has called on specialists in all fields, ranging from Gropius and Giedion to Arp, Leger and Gabo to philosophers, poets and scientists, so that each specialist contributor could give an explanation of this new vision in his field.

Although there is no conclusion—because it is too early yet to arrive at one—the book is so thought-provoking and exciting that anyone interested in things visual can't afford not to peruse it.

F. H. K. Henrion

Material Consideration

VITA DEI MATERIALI NELLA ARCHITETTURA. *By Giulio Roisecco. Soc. Ed. Vitali Ghiunda, Genoa. Lire 3000.*

Professor Roisecco teaches Structure at Rome University. He is a pupil of Nervi, and Nervi is quoted in the foreword: 'In your accurate study you have shown the manifold relations between building materials and architecture, and drawn attention to the practical, the structural, and the aesthetic importance of their rational and proper use. This seems to be a very opportunely timed job, for the sensible use of materials, is an essential condition of any correct architectural achievement.' The author often refers to Nervi and about as often to Wright and Neutra. Among his illustrations are some from Japan, others from the Italian Middle Ages and Renaissance, yet others from Germany. The juxtapositions are stimulating and the equal sympathy for the past and present are gratifying and incidentally very Italian. The chapters of the book deal with the supply of materials, local traditions, the use of materials, the influence of climate and locality, and finally architectural expression. The 180 illustrations are excellently chosen but poorly printed and the long captions sometimes get dangerously near to padding. The book is paper bound and considering this, rather expensive.

N.P.

The Complete Works

SPECIFICATION 1959. *Editor: F.R.S. Yorke, F.R.I.B.A. Asst Editor.: Penelope Whiting, A.R.I.B.A. Architectural Press. 35s.*

The latest edition of this reference book includes an extensive revision of Carpenter and Joiner to keep pace with recent developments in the use of timber both as a structural and a finishing material. For example, an entirely new section, Timber Engineering, contributed by D. W. Cooper, has been included which deals with structural uses of timber in all its forms from portal frames in laminated construction spanning up to 75 ft. to the humble, but highly efficient, small-span trusses designed by the Timber Development Association. The use of timber as a finishing material includes an exhaustive analysis of plywoods and other building boards. Timber also features in the section on Curtain Walling where several proprietary systems in timber are included.

The publication of a new Code of Practice has necessitated considerable revision of Roofer and several new materials have been included. New equipment, materials and methods of construction have also caused revisions to the sections on Electrical Engineer, Piling, Structural Aluminium and Shops.

Specification specimen clauses are of the usual high standard. It is interesting to note that the Editors considered substituting check lists for full specimen clauses, but rejected the idea after experiments proved that in many cases the headings without the clauses were useless or confusing. Specification writers who regularly use this sturdy volume will surely applaud the Editors' decision to retain the existing system.

G.T.

MARGINALIA

Coalbrookdale Museum

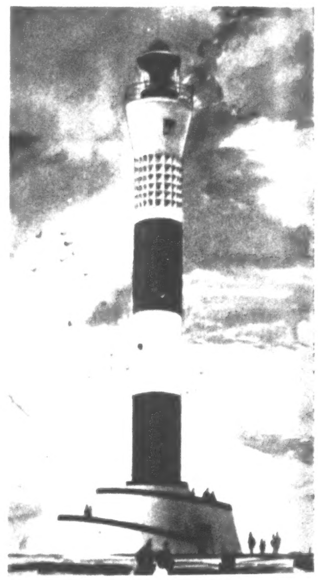
The 250th anniversary of the first successful use of coke in iron-smelting has been celebrated by the conversion of the place where this innovation took place—Abraham Darby's furnace in Coalbrookdale—into a museum. As a monument in the history of western technology, the site is of extreme importance, comparable to the remains of the Bessemer plant at Sandvicken (Marginalia, AR, October, 1958) and the formation of a museum, housing a good deal of the history and productions of the Darby family, in the heart of the characteristic early-industrial land townscape they helped to create, is to be applauded as an imaginative and responsible action on the part of Allied Ironfounders. Unfortunately, the visual and architectural problems attendant in the setting up of this kind of 'on-site' museum have been handled in a manner that falls far below the standards set at Sandvicken, or in the LCC's handling of the *Cutty Sark*. Thus, the gates and lamp-standard in

1

1, are not original, but a rather pedestrian reproduction, as the date reveals, while to their right the whole treatment relapses into municipal grass and chain-link fencing. Neither part of this fence—the quasi-monumental or the semi-subtopian—matches up to the character of the architecture of the furnaces, 2, nor does it make an adequate foil to it. Let us hope that when, as seems inevitable, the scheme has to be extended, an effort will be made to bring the new work up to the standard of the old.

To the Lighthouse—Again

The last lighthouse to be built in England was erected before Modern Architecture began, over half a century ago, and the technical and architectural history of lighthouses in this country will jump straight from mass-walling in masonry, and oil or gas lighting (as things were at the time of design) to prestressed, post-tensioned concrete, electric lanterns of 600,000 candlepower, and automatic fog-warnings, when the second Dungeness light is completed in the next few months. The new lighthouse is a plain



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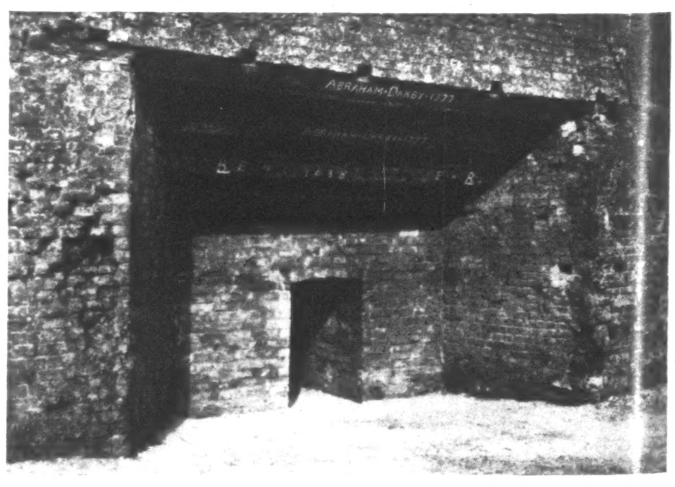
cylinder in form, 3, designed by Ronald Ward and Partners, with pre-stressing cables taken from various heights, down through the thickness of the walls of the pre-cast drums of which it is built, to anchorages in the foundations. A spiral ramp to a public observation-platform surrounds the base, and there is a 'belfry grille' of precast, trumpet-shaped



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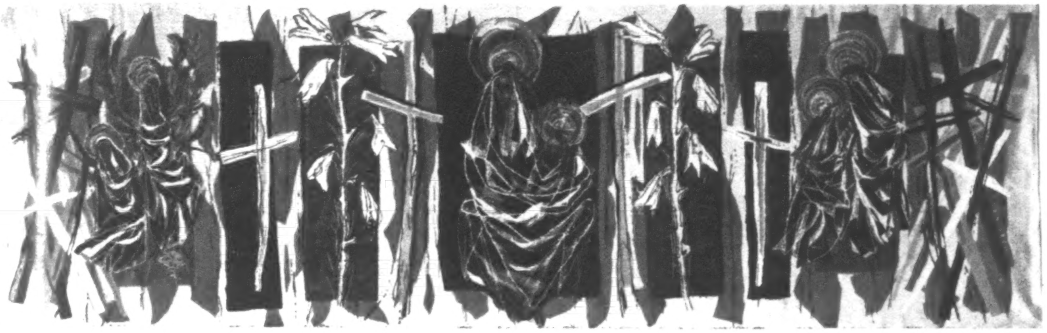

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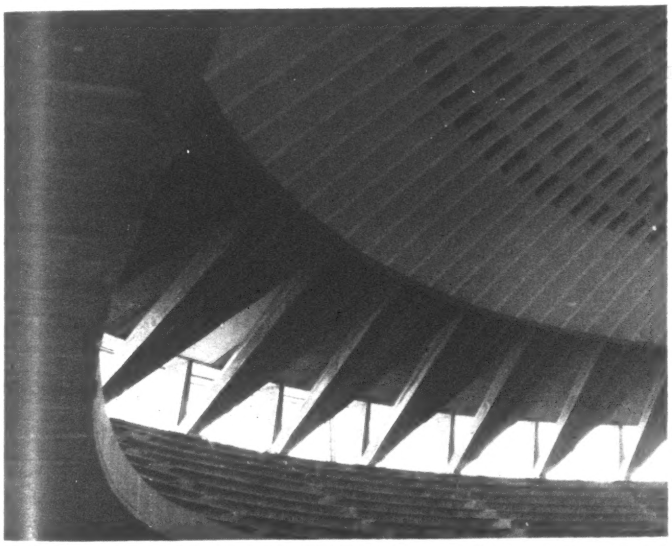
4, *altar frontal for Swansea Parish Church, designed and executed by Margaret Kaye.*

units near the top to emit the sound of the foghorn. The functional-traditional black-and-white banding is not painted, but is formed by a permanent finish of specially selected aggregate with suitably coloured cements.

Roman Games

Two recent photographs, 5 and 6, by G. E. Kidder Smith, of the nearly completed circular covered stadium at Rome, the Palazzo dello Sport, for the 1960 Olympic Games. The designer is Pier Luigi Nervi.



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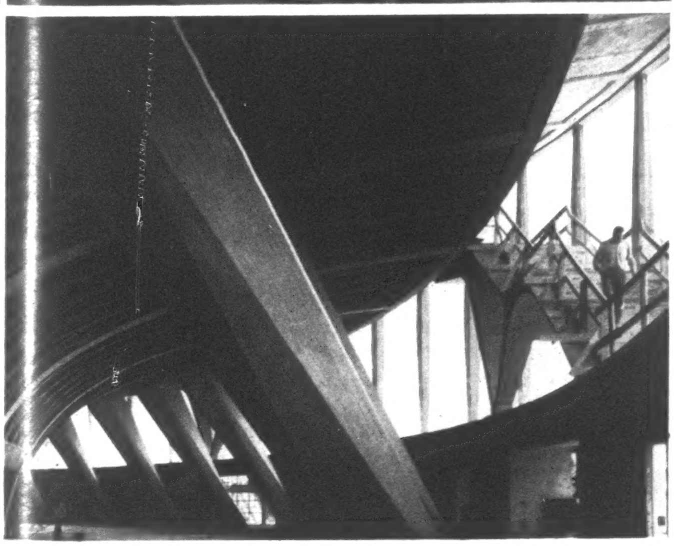

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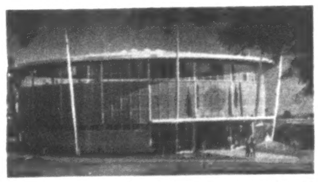
First Permanent UK Pavilion

Whatever the political or economic reasons that prompted its erection, the appearance of a permanent British pavilion (the first of its kind) on the Rand Show site at Johannesburg is a welcome development in Board of Trade policy toward overseas exhibitions. The pavilion itself, 8, designed by Fleming and Cooke, is a simple rotunda, covered by a dome 110 feet in diameter, whose weight is only partly carried by the rotunda, some of the permanent roof loads, as well as the wind loads, being transferred by guy-wires to ten masts evenly spaced around the structure. Internally, 9, there is a mezzanine floor served by two spiral ramps, one inside and the other outside the building, and the minimum of other permanent structures (apart from a small



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9

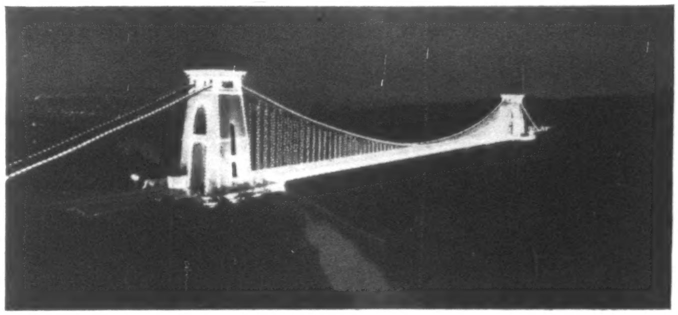
cinema) so that the space can be as adaptable as possible for different kinds of exhibits. It is to be hoped that positive action on this scale will be followed by equally positive action over the next *Triennale di Milano*, and other international exhibitions of comparable status.

Canals in Safe Keeping

Among other good things in the 1958-59 report of the National Trust is the news, that two stretches of canal are in process of negotiation for acquisition by the Trust and that the negotiations, though complex, are in a very advanced stage. The two stretches in question are from Lapworth to Stratford on the Stratford-on-Avon Canal, the other is the southern section (Stourport, Kidderminster, Kinver) of the Staffordshire and Worcestershire Canal. Both, of course, come within the category of places of natural beauty (whatever its man-made basis) that the Trust is empowered to acquire, but both are also, of course, monuments of early industrialism, and it is to be hoped that these acquisitions may establish a flexible precedent that can be stretched to cover other uneconomic, but scenically and historically valuable canals, with the ultimate aim of creating a canal-side linear National Park.

Let there be Light

7, Brunel's suspension bridge at Clifton, near Bristol, was illuminated to mark the centenary of his death and thus provided a spectacular new view of one of the most important monuments in the west of England. The



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illuminations have now been removed and it seems that there are no plans to repeat them next year—it is a great pity that so successful an experiment should not lead to an annual lighting-up of the bridge and it is to be hoped that the Bristol City Fathers will have second thoughts before next summer.

ACKNOWLEDGMENTS

MARGINALIA, pages 299–301: 3, the Builder; 5, 6, Kidder Smith; 7, Bromhead (Bristol); 8, 9, Industrial Architecture. FRONTISPIECE, page 302: Paul Dony. UNIVERSITY LIBRARY, SHEFFIELD, pages 307–314: 1, AR Aerial Unit; remainder, Henk Snoek. CURRICULUM, pages 315–323: 3, King's College, Newcastle; remainder, James Gowan. THREE CHURCHES, pages 324–331: 1, 4, 5, Edward D. Mills; 2, 3, 6, Henk Snoek; 7, 9, Cecil Thomas; 8, 10–13, 15, 16, 18–21, Galwey Arphot. INTERIOR DESIGN, pages 337–339: Toomey Arphot. DESIGN REVIEW, page 340: 1, Austin Motor Co.; 4, Nuffield Organisation. WORLD, pages 345–346: 1, Photogrameiricos; 2, Pando photograph; 3, Plasencia; 4, Moncloa; 5, Arkitektur; 6–8, Domus; 9, 10, Alexandre Georges, Exhibition of Structures by Buckminster Fuller. CHURCHES OF THE PUNA DE ATACAMA, pages 347–349: Paul Dony. CURRENT ARCHITECTURE, pages 350–353: 1–3, Wainwright; 4, Denys Lasdun; 5, John Maltby; 6, Tothill Press; 7–9, Galwey Arphot. MISCELLANY, pages 354–358: Exhibitions, 2, Gimpel Fils; 3, 4, James Mortimer; 6, Laboratorio Fotografico. History, Country Life. Functional Folly, 1, 4, 9, John Piper; 2, 3, 6, 8, 10, J. M. Richards; 5, Marcus Whiffen; 7, Galwey Arphot. Counter Attack, Andor Gomme. SKILL, pages 359–363: 2, Turners Photography; 3, 5, 15, 16, Monsanto Chemical Co.; 4, John Adams/Bakelite; 6, E. J. Jackson/Bakelite; 7, Bakelite; 11, Giornalfoto Milano; 12, 14, Publifoto; 13, Lee Angle Photography; 17, Monsanto Chemical Co./Robert C. Cleveland; 18, Hubert Davey/Bakelite; 19, Polyfoto; 20, Willy Kessels. THE INDUSTRY, pages 364–368: 5, Deighton Wilkes and Co.

The armed angel of Casabindo, opposite is one of the angeles caballeros who may be found in paintings in some of the churches along the Camino de los Incas high on the Argentine side of the Andes. The musket he carries is an entirely proper attribute for a guardian angel in this bleak land that has always been one of the frontier territories of the human race, as well as of the Christian religion, and the primitive churches of the region, together with their hard-won decoration, are the subject of an article on pages 347–349.

Peter Collins

BIOLOGICAL ANALOGY

1959 marks the centenary of The Origin of Species, *a work that threatened at one time to make biology the master of philosophy. But Darwin was not the first biologist to enunciate doctrines with wider implications, and the entanglements of biology and architectural thought have a history that goes back a century further, to Buffon and Linnaeus as Professor Collins shows in the article below.*

The purpose of analogy is to familiarize us with new ideas by linking them to ideas we already understand. It is not uncommon, however, for new theories to be linked analogously to ideas which are hardly understood by anyone, but which have captured the popular imagination by their progressive appeal. Perhaps also the less an audience understands of a subject used as an analogy, the more impressive does the argument appear. This results, if I may fall into the same trap myself, from some kind of osmosis of profundity. People today talk glibly of 'chain reactions' as if the principles of nuclear physics were obvious to anyone. A century ago, the favourite words were 'germ' and 'evolution.' Now that we are celebrating the centenary of the publication of *The Origin of Species*, it may be useful to examine the influence of biological analogies on architectural theory, and try to assess their usefulness with respect to the architecture of our own day.

The origins of the biological analogy, like so many ideas which have influenced modern architectural doctrines, can be traced to about the year 1750. At that time, two epoch-making scientific books were published: Linnaeus's *Species Plantarum* (1753), in which the entire vegetable kingdom was classified binominally according to the disposition of the female reproductive organs, or 'styles,' and Buffon's *Histoire Naturelle* (1749), a vast compendium which attempted to incorporate all biological phenomena into a general interpretation of the laws governing the universe. Linnaeus's work does not immediately concern this present inquiry. Buffon, however, is of considerable relevance, since he disagreed both with Linnaeus's immutable species, and with his whole doctrine of classification by arbitrarily chosen characteristics. On the contrary, he believed that this kind of compilation obscured the fact that all species must have derived from a single type, and, supporting his views on this subject both by the evidence of fossil shells, and by reference to mammoths recently discovered in Siberia he put forward a philosophy of creation in which the idea of evolution was expressed clearly for the first time.

In so far as his system relates to biological ideas used later by architectural theorists, there are two features which deserve mention. The first is that, in hitting upon the idea of evolution, he saw it as essentially a process of degeneration, not of improvement, since his religious beliefs (or his respect for those held by his contemporaries) prevented him from assigning the evolutionary process to any but the lower animals. On the other hand he was the first scientist to distinguish correctly between the 'vegetative' and specifically 'animal' parts of animals, whereby an animal may be regarded simply as a vegetable organism endowed with the power of moving from place to place. Thus 'organic life' has come to mean, for architectural theorists at least, the sum of the functions of the 'vegetative' class, for all living organisms, whether plants or animals, possess them to a more or less marked degree.

The scientist who first gave classical expression to this meaning of 'organic' was Xavier Bichat, whose *Physiological Researches on Life and Death* was published in 1800. Until then it was normal, especially in view of the humanistic culture of the age, for the biological analogy to refer to animals rather than plants. Lord Kames, for example, who disliked symmetry in gardens, contended nevertheless that 'in organized bodies comprehended under one view, nature studies regularity, which for the same reason, ought to be studied in architecture.' At the beginning of the nineteenth century, however, 'organic' came to be regarded less as a quality of 'life which moves'. It was thus the asymmetry of plants and viscera, rather than the symmetry of animal skeletons, which came to be accepted as characteristic of organic structures, whereby biology could still be adduced to support the architectural fashions of the age.

The most important enunciations of evolutionary theory at this time were those published by Lamarck. Lamarck was essentially a botanist of the school of Buffon, but when, at the age of fifty, he was appointed professor of Zoology by the

National Convention without any previous experience at all, he was obliged to transfer his attention to the study of anatomy. As a result of this combination of disciplines, he was eventually led to conclude that living forms had not evolved retrogressively as Buffon had believed, but progressively. This change of attitude was only to be expected. Buffon, living in the age of Rousseau, and at a time when the Book of Genesis was literally accepted, naturally favoured a hypothesis implying a Fall from perfection. Lamarck, in the age of Revolution, and at a time when the idea of Progress was literally accepted, naturally favoured a contrary view.

Similarly, it was not entirely strange that Lamarck should suggest that evolution was due to environment. The importance of this influence on art, law and society had already been emphasized by Winckelmann, Montesquieu and de Goguet respectively, although they did not, as far as I know, go so far as to say that it actually caused evolution direct. This, however, was the essence of Lamarck's revolutionary argument. 'It is not,' he wrote, 'the organs—that is to say, the form and character of the animal's bodily parts—which have given rise to its habits and peculiar properties, but, on the contrary, it is its habits and manner of life and the conditions in which its ancestors lived that has in the course of time fashioned its bodily form, its organs and its qualities.'

The word 'biology,' or science of life, was invented by Lamarck in about 1800; at the same time, the word 'morphology,' or science of form, was invented by Goethe, who in his own day was as famous as a scientist as he was as a poet. Being a poet, however, he understood the term morphology in a much wider sense than we do today (when the subjects of its study are confined to the comparison and relationships of living structures and their development), and included non-living forms such as rocks. This, as we shall see, was to be another element of confusion in the biological analogy in that, from its inception, there was uncertainty as whether morphology was concerned with structures which live, or with structures which grow. Félix Vicq d'Azyr, for example, at the end of the eighteenth century, had rejected the old comparison between the growth of organisms and the growth of crystals, contending that crystals are mathematically regular in shape and homogeneous in structure, whereas organisms are of rounded shapes and complex composition. On the other hand Jacob Schleiden, fifty years later, considered that life was nothing more or less than a 'form-building force,' and he considered the growth of crystals and organisms to belong to the same category of phenomena. As late as 1898, Herbert Spencer could still assert that the growth of crystals and organisms was 'an essentially similar process.' Since it was Spencer's biological works which mainly influenced Frank Lloyd Wright, the possible effects of this ambiguity will be obvious.

Moreover, as soon as the new science of morphology was established, and pursued methodically by the study of comparative anatomy, two dilemmas in the interpretation of the facts at once made themselves apparent: does form follow function, or does function follow form? To the layman, the conundrum might appear futile and insoluble, but to those familiar with the history of modern architectural theories its importance will need no justification. Amongst biologists, the distinction was considered sufficiently important to perpetuate a bitter quarrel for half a century, the leader of the 'form follows function' school being Georges Cuvier, the leader of the opposing faction being Geoffroy Saint-Hilaire. Cuvier (who was incidentally a friend of the architect A. T. Brogniart, and obtained his assistance in examining fossilized building stones) stated that every modification of a function entailed the modification of an organ. Geoffroy Saint-Hilaire protested against arguing from function to structure as an 'abuse of final causes.' The controversy might well have continued indefinitely had it not been that advances in cell-theory distracted attention from morphology, by causing organisms to be seen no longer as cleverly constructed mechanisms but simply as an aggregate of cells.

In the event, when the biological analogy was first seriously applied to art theory, the delicate topic of 'form versus function' was avoided completely, since interest was concentrated on the way forms grow, rather than on the way they work. From the time aesthetics became associated with psychology in the middle of the eighteenth century, philosophers had been trying to explain how inspiration (or 'genius' as it was sometimes called) grew in the human mind. Buffon himself, in his speech on *Style* to the Academie Française (1753) was perhaps the first to hint at a biological analogy when he remarked that 'the human mind can create nothing, and only produces after having been fertilized by experience and meditation, in that its perceptions are the germs of its products.' Later Young, in his *Conjectures on Original Composition* (1759), stated that 'an original may be said to be of a vegetable nature; it rises spontaneously from the vital root of genius; it grows, it is not made.' But it was left to Samuel Taylor Coleridge to express the idea as a complete artistic theory.

There seems little doubt that Coleridge derived his ideas from Germany, where he had studied in his youth and where such ideas had long been in circulation. Young's *Conjectures*, though virtually ignored in England, had been twice translated into German within two years of its publication, and had become an important part of the gospel of Storm and Stress. J. G. Herder, in his essay *On the Knowing and Feeling of the Human Soul* (1778), had used plants as an analogy for the development of art forms from the soil of their own time and place. Goethe, in his famous early essay on German architecture, had described Gothic as the organic product of growth in the mind of genius. But Coleridge, who was himself an amateur biologist, not merely translated these views into English; he organized the attack against the whole 'Mechanico-Corpuscular' philosophy of creation. 'The form is mechanic,' he wrote, 'when on any given material we impress a predetermined form, as when to a mass of wet clay we give whatever shape we wish it to retain when hardened. The organic form, on the other hand, is innate, it shapes as it develops itself from within, and the fullness of its development is one and the same with the perfection of its outward form.'

Several criticisms relevant to the present enquiry may be made concerning Coleridge's views. One is that the process of artistic creation is explained by him as virtually an unwilled and unconscious process of mind. The second is that however violently he might attack the 'mechanical' theory, it has been frequently used by biologists to explain how living organisms actually work. It was not only early philosophers such as Descartes who regarded the animal body as a machine. One of the most famous of Cuvier's disciples, Henri Milne-Edwards, stated that he had 'tried to grasp the manner in which organic forms might have been invented by comparing and studying living things as if they were machines created by the industry of man.' Finally, it is worth noting that no explanation of morphological development was more mechanistic than Darwin's 'Natural Selection.'

It has already been pointed out that by 1859 there was nothing novel in the idea of evolution as applied to the theory of life, even though the term 'evolution' was not used in this sense until 1831. This is equally true with regard to the theory of architecture. The classical architects of the early eighteenth century believed implicitly in evolution, since they believed that the moderns had improved on the Romans, just as the Romans improved on the Greeks. Even mid-nineteenth-century writers on architecture such as Fergusson, who specifically criticized Lamarck's

theories, believed in architectural evolution because they believed in Progress. For biologists the novelty of Darwin's theory was that it attributed evolution to a selection of *existing* forms (or, to put it another way, the elimination of obsolescent forms) by Nature herself. It thus inevitably weighed the balance in favour of the 'function follows form' school by presupposing that the forms existed in the first place. Lamarck had claimed that a change in environment actually modifies the form of animals, and that these changes are transmitted by heredity. Darwin claimed, on the contrary, that the changes were arbitrary and accidental, and that species changed only because the unfunctional forms never survived. He compared the action of natural selection to that of a man building a house from field-stones of various shapes. The shapes of these stones, he said, would be due to definite causes, but the uses to which the stones were put in the building would not be explicable by those causes. Yet as Charles Singer has pointed out, when a man builds a house, there is the intervention of a definite purpose, directed towards a fixed end and governed by a clearly conceived idea. 'The builder in the proper sense of the word *selects*. But the acts of selection—mental events in the builder's mind—have no relation to the "causes" which produced the stones. They cannot therefore be compared with the action of Natural Selection.' Architectural theorists who are guilty of similarly inexact analogies between building and botany may find consolation in the thought that a classic precedent was furnished by the Master himself.

If in fact we look at those phenomena which scientists consider as biological, we shall see that the number of exact parallels which can be drawn are slight. Vicq d'Azyr classified organic functions into nine categories: digestion, nutrition, circulation, respiration, secretion, ossification, generation, irritability and sensibility, and of these only circulation would seem to have any analogy with the function of buildings. Similarly, if we examine morphological systems of classification, whether it be the Linnaean system (based on one selected feature), Cuvier's system (based on total structure related to inner parts), or the system of von Baer (based on what he called the 'spatial relationship' of organic elements, i.e. radial, longitudinal, massive and vertebrate), there seems little even remotely suggestive of buildings and the way they are designed. It would seem as if the analogy must always be general and poetic, and in fact the features held in common seem limited to four: the relationship of organisms to their environment, the correlation between organs, the relationship of form to function, and the principle of vitality itself.

The most comprehensible analogy concerns the influence of environment on design, an idea which undoubtedly derived its main stimulus from Darwin, although it first emerged in the work of Alexander von Humboldt, who opposed the academic methods of Linnaeus and suggested that plants should be classified according to the climates in which they were found, rather than according to inherent characters determinable in a museum. Being of a romantic and aesthetic disposition, he sought a system of classification through the impression made by landscapes when simply looked at by the ordinary observer. He was very interested in architecture and described in detail the pre-Columbian buildings he found in Central America. He nowhere seems to have suggested, however, that the design of buildings had much relationship with topography and vegetation, although he thought that pyramids were best suited to mountainous ground. Only in the sphere of engineering did he exert any influence on construction, in that his description of Peruvian suspension bridges is known to have suggested modern experiments in this field.

Darwin naturally took von Humboldt's doctrine considerably further by contending that Nature had *selected* those forms which were most suitable for the environments in which they were situated, but he offered no suggestion as to how Nature created such forms in the first place. He had in fact no training and probably little interest in pure morphology, and in so far as his work affected morphological studies, it was to cause the public to regard organisms *historically*. In his first draft of *The Origin of Species*, written in 1842, he remarked that 'we must look at every complicated mechanism and instinct as the summary of a long history of useful contrivances much like a work of art.' Whether or not he actually regarded the history of architecture as analogous with natural selection, I do not know. But there can be little doubt that, so far as his biological theory of the relationship of form to environment is concerned, the relevance of Darwinism to architecture has tended to decrease. Improvements in air-conditioning equipment are making architectural form increasingly independent of climatic considerations. Only in districts where distinctive local materials can be used for domestic architecture is there any likelihood of regional characteristics influencing form, and even in newly developed areas where the example has been set, such as Arizona, there seems little evidence of a desire to carry the movement very far.

As regards the 'correlation between organs' (which one might perhaps compare with the relationship between the parts of a building), the fact was first enunciated as a biological principle by Vicq d'Azyr, who pointed out that a certain shape of tooth presupposes a certain type of structure in the extremities and the digestive canal, because the animal's bodily parts are adapted to its way of living. This idea was taken even further by Cuvier, who, from small fossil fragments, showed how one could reconstruct extinct animals by a sequence of deductions based on the interdependence of each organic part. Yet in so far as this discovery relates to architectural theory, it suggests merely a curious parallel with the Renaissance theory of modular proportions, whereby, as the Humanists had observed, the proportions of the human body are so standardized that if one were to find the finger of an antique statue, it would be possible, theoretically, to reconstruct the whole (a fact enthusiastically seized upon by the great forgers of the age). However, the only use to which Cuvier's discovery was put by nineteenth-century theorists was in proving that the 'imitation of styles' was morally wrong, since it left false evidence for future historians. After describing zoological reconstructions of prehistoric animals in his *True Principles of Beauty in Art* (1849), Fergusson added: 'With the same facility with which a fossil impress or a bone does this for the geologist, does any true style of art enable the archaeologist to tell from a few fragments in what century the building to which it belonged was erected.'

In general, the only major biological fact which seems directly analogous to modern architecture concerns the relationship of form to function, but as we have seen, the theory that form follows function was hotly contested by those who believed that function follows form. It is curious to note that this dilemma was specifically pointed out by Herbert Spencer, from whose writings (so Frank Lloyd Wright tells us) Louis Sullivan derived many, if not all, his biological ideas. However, since nobody has ever denied the obvious fact that form and function are in some way related, it is worth considering how this relationship does fit in with a theory of design.

In case it should be objected that such a topic is not part of the 'Organic' theory at all, but of the 'Functional' theory, it is opportune to suggest that whereas in the functional analogy, the relationship between form and function is considered as necessary to *beauty*, in the biological analogy, it is considered as necessary to *life*. Historians are generally agreed that credit for this new interpretation must

be given, as far as architectural theory is concerned, to Louis Sullivan, although it may be noted that he never expressed it or applied it until after he had met Wright. It had been foreshadowed by Greenough and Baudelaire, who, perhaps with von Humboldt in mind, suggested that the best critics were those who had travelled alone through forests and prairies, contemplating, dissecting and writing. 'They know,' he wrote, 'the admirable, inevitable relationship between form and function.' Similarly, Viollet-le-Duc, like Ruskin before him, drew attention to the way mediaeval sculptors had studied the morphology of vegetation, and how they understood that the contours of plants 'always express a function, or submit themselves to the necessities of the organisms.' He did not, however, draw any major philosophical conclusions from this observation, except to say that the masons 'sought to bring out in the structures of their buildings those qualities they found in vegetation.' The French Rationalists were in fact more interested in the idea that form follows structure (which they found quite intelligible without the use of elaborate analogies), so that there can be little doubt that it was Sullivan who first made biological analogies the foundation of a total architectural doctrine.

Sullivan seems to have derived little inspiration from Viollet-le-Duc's theories, since his main interest was in composition rather than in construction (which he left to Adler). Yet following the anti-academic fashion of his age, he objected to the term 'composition,' although in the circumstances it is difficult to see why. Since 'decomposition' is the chief characteristic of organisms which are dead, it might reasonably be inferred that 'composition' is the chief characteristic of organisms which are living. But, like so many theorists who have found the biological analogy stimulating, he never really pursued it very deeply, and made little distinction as to whether it referred to the object created or the process of design. Whilst some of his writings suggest a Lamarckian interpretation of evolution (as when he wrote that 'it was not simply a matter of form expressing function; the vital idea was that the function *created* or organized its form'), most of them suggest the Coleridgean analogy between biology and poetic vision. It is perhaps significant that his first enunciation of an architectural doctrine—the address on *Inspiration* given to the Western Association of Architects' Convention—was in the form of a long poem intelligible only to three other people in the room.

In the present century the biological analogy has been associated primarily with Frank Lloyd Wright, into whose young hands Sullivan enthusiastically transmitted his copy of Spencer's biological works. What Wright has meant by 'Organic Architecture' has never been clear; the difficulty is that for Wright it meant so much; crystalline plan forms, the possibility of growth by asymmetrical addition, the relationship of composition to site and client, the use of local materials, the individuality of every created thing, the need for every artist to endow his work with the integrity of his innermost being, and so on. But primarily it meant for him a *living* architecture; an architecture in which useless forms were sloughed off as part of the process of a nation's growth, and in which every composition, every element and every detail was deliberately shaped for the job it had to perform. To this interpretation no one can take exception, and perhaps the safest thing to say of the Biological Analogy is that it is simply a more poetic expression of the ideal of *L'Architecture Vivante*.

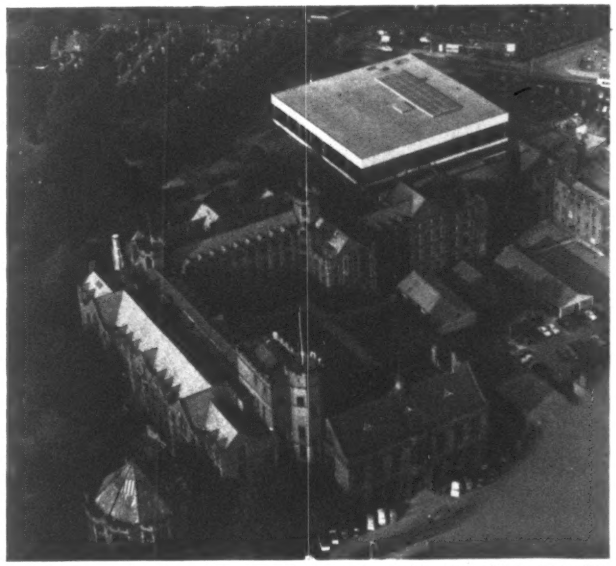
It is now a century since the *Revue Générale de l'Architecture* launched the slogan 'Organic Architecture' in this sense, although at the time it proved premature. 'We have named it Organic,' wrote the editor in 1863*, 'because it is, in relationship to the Historic and Eclectic Schools, what the organized life of animals and vegetables is in relationship to the unorganized existence of the rocks which form the substratum of the world.' Since then, many developments have occurred in biological theory, and many in architectural practice. Occasionally some of the former can be paralleled with some of the latter. Claude Bernard's discoveries concerning the way the body adapts itself to changing conditions (or vaso-motor mechanism) suggest clear parallels with the flexibility of modern planning. Similarly Milne-Edwards's law of economy, which states that nature does not always create a new organ for a new function, but often adapts undifferentiated parts to special functions, or even converts to other uses organs already specialized, suggests many interesting parallels in this present age of standardized forms. Most important of all, Wilhelm Roux's discovery that the blood-vascular system is largely determined by direct adaptation to functional requirements demonstrates that form does occasionally follow function after all. But in general, detailed analogies are as dangerous now as when the slogan was first formulated, and apart from holding that architecture must be a living art, we cannot go much deeper into the mystery of life than when *The Origin of Species* was first given to an astonished and excited world.

Within the last few years, however, one surprising change has occurred in the philosophy of architecture which provides a curiously apposite termination to a study of the influence of Darwin. The nineteenth century's naïve faith in evolutionary progress is now being seriously challenged, and a suspicion has arisen that Buffon's approach may not have been entirely wrong. This does not of course mean that optimism has given place to pessimism, but simply that we no longer accept, like the followers of Darwin, the idea that every change is for the best. Recently however it has become clear, in both Europe and America, that the leading architectural periodicals are no longer content merely to divide all new buildings into the two categories: 'evolutionary' and 'vestigial,' and leave it at that; they are subjecting contemporary architecture to systematic criticism in order to determine how improvements can best be brought about.

This, of course, is the very opposite of natural selection, but it has become necessary because we can no longer afford to regard every new 'contemporary' building as automatically an advance on the rest. In the early years of the International Style, there was much to be said for accepting every manifestation of the new spirit uncritically, since premature disparagement might have stunted its early growth. Today, when the functional forms evolved by the leading modern architects are so widely accepted, there is obvious danger of their misuse, and nothing can better serve the advancement of architecture than that examples of this should be publicly singled out.

An even more cogent reason for the new critical attitude is that, just as biologists have become very conscious of 'biotic' environment (i.e. the influence of free organisms on each other), so we are becoming much more aware that 'environment' does not only comprise natural scenery, but also the accumulated legacy of the buildings in our towns. The urban scene, especially in America, is in many districts predominantly 'contemporary,' so that modern architecture has no longer an excuse for ignoring its neighbours. On the other hand, with the general acceptance of functionalism, there is no need to perpetuate the early revolutionaries' aggressive disdain for the so-called 'beaux-arts' styles. Such buildings, when juxtaposed against our own, bear gratifying testimony to the victory of the fittest, but they also carry the awful warning that, in architecture, it is not necessarily only the Fittest which Survive.

* The earliest use I have found of the word 'organic' with specific reference to a 'living' architecture occurs in Lamennais' beautiful eulogy of Gothic buildings in *De l'Art et du Beau* (1841): 'Ce qui les caractérise, c'est le travail organique qui de tant d'éléments divers a fait une seule forme, dont les innombrables parties . . . se fondent en un corps unique et vivant'.



1. air view, showing the new library alongside the old university buildings. The old library is the detached octagonal building in the bottom left-hand corner

UNIVERSITY LIBRARY, SHEFFIELD

ARCHITECTS	***GOLLINS, MELVIN, WARD AND PARTNERS***
assistant architects	***M. Litchfield, B. J. Mayes, H. Prime***

2. from the east, looking towards the corner on which the main entrance is situated.

3

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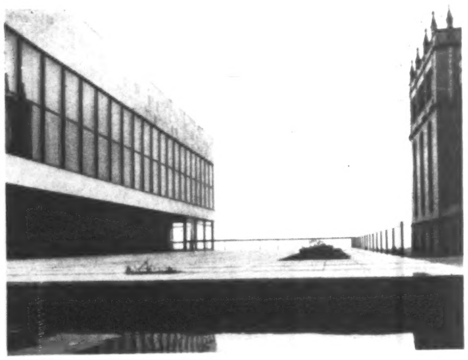

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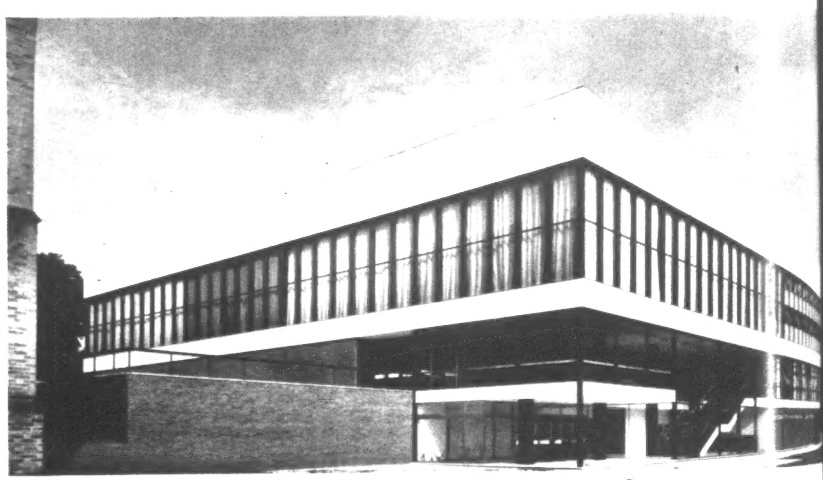
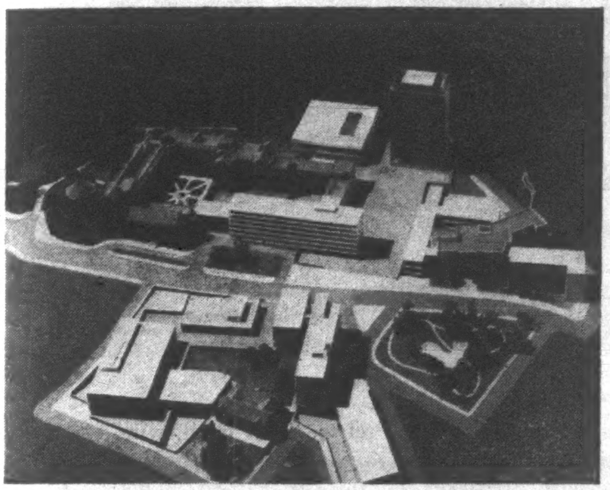


6

3. a section of the north-east façade, facing the future campus. On the left is the entrance vestibule. Through the glass wall can also be seen the main staircase and the mezzanine floor.
4. looking along the south-east façade, across the mezzanine-level terrace that separates the library from the old university buildings.
5. the main entrance. On the left is the retaining-wall of the terrace shown above.
6. terrace and library from the east. The upper floor, above book-stack level, contains the main and subsidiary reading rooms.

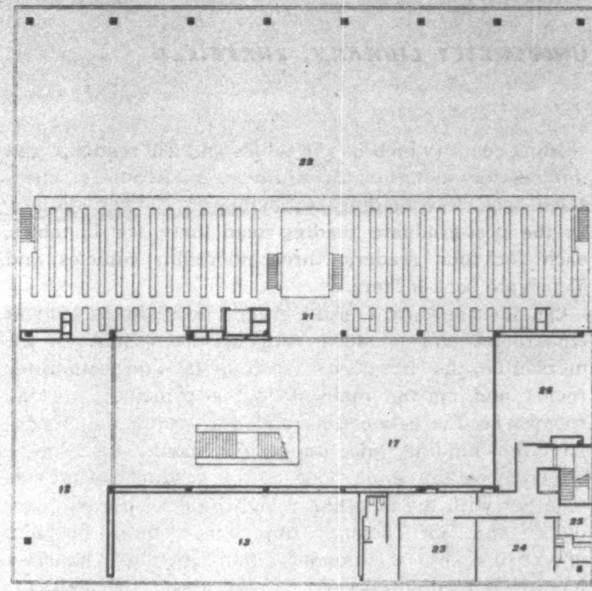
The library is the first to be completed of the group of buildings which was the subject of an open competition, held in 1953, for the development of the central area of Sheffield university. The site is a corner of Weston Park, which the City Corporation made available for the University; it lies immediately north-east of the existing university buildings. There is a steep fall from west to east.

The form of the library is a low square, 155ft. along each side, 52ft. high on the east or campus side and 32ft. high on the west or park side. This allows it to act as a foil to the 16-storey Arts block on which constructional work is to start early in 1961, and to the long low chemistry block which forms the east boundary of the campus. This is already under construction.

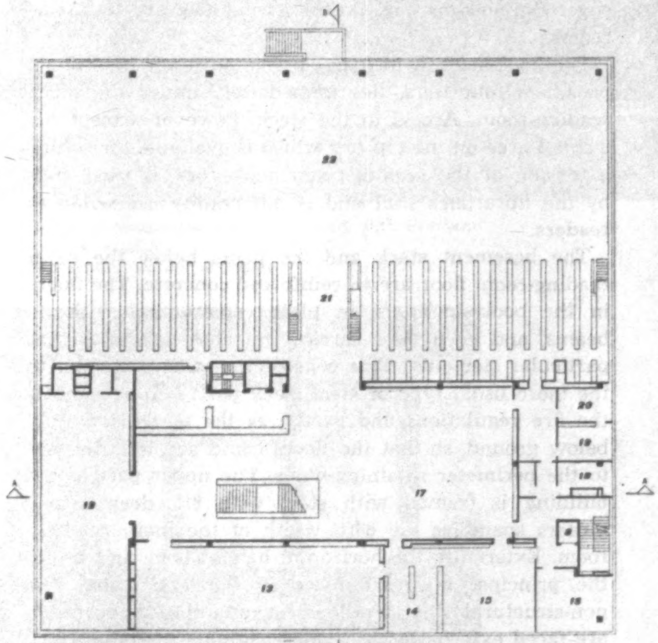


7, revised redevelopment scheme for the Western Bank area of the university, of which the library (centre top) is the first instalment. Alongside it is the 16-storey Arts tower, starting next year.

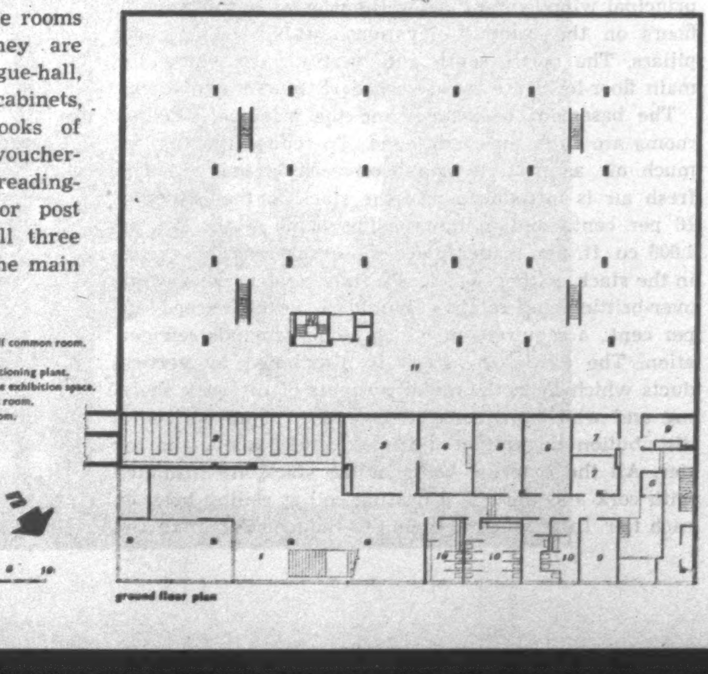
To ensure that no books can be taken away without the issue of a voucher, the plan is divided into two parts: the rooms within, and those outside, the entrance and exit turnstiles. Within the control lie all the rooms to which readers normally have access. They are approached from the centrally placed catalogue-hall, in which are the card-index catalogue cabinets, shelving for bibliographical and standard books of reference and the combined issue-desk and voucher-counter. Also within the control lie the main reading-room and the two smaller reading-rooms for post graduates and current periodicals, access to all three being from the catalogue-hall. At the back of the main



second floor plan



first floor plan



ground floor plan

key
1, entrance hall.
2, cloakroom.
3, processing room.
4, dark room.
5, stationery store.
6, strong room.
7, cleaners.
8, lift.
9, mess room.
10, lavatory.
11, book stack.
12, post-graduate reading room.
13, periodicals reading room.
14, binding and unpacking.
15, cataloguing.
16, labelling.
17, catalogue hall.
18, inter-library loans office.
19, deputy librarian.
20, secretary.
21, reading room book store.
22, reading room.
23, female staff common room.
24, male staff common room.
25, kitchen.
26, air-conditioning plant.
27, mezzanine exhibition space.
28, pamphlet room.
29, thesis room.

Between ground and first floor, in the front part of the building not occupied by the tiers of book-stacks, there is also a mezzanine floor (see sections overleaf) through which the main staircase rises. This provides exhibition space and at the same level is the librarian's office.

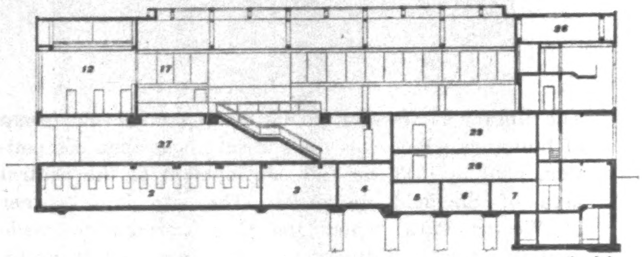
reading-room (which has 76 tables and 280 readers), and immediately alongside the entrance, is a two-tiered open-stack book-store holding approximately 130,000 volumes. In the post-graduate reading-room there are 12 tables, each for four readers, three microfilm cubicles and 55 private book-lockers.

Outside the control on the ground floor are the student cloakrooms and lavatories and service rooms, on the mezzanine the librarian's, secretaries' and committee rooms and on the main floor the principal working rooms: i.e. the cataloguing and new acquisition rooms, and the binding and unpacking rooms, etc. These, although on the same floor as the reading-rooms, can, together with the labelling room, the inter-library loans office and the deputy librarian's office, be also approached by a secondary non-controlled staircase having immediate access to the goods lift and the covered unloading bay. On the second floor are staff rest-rooms.

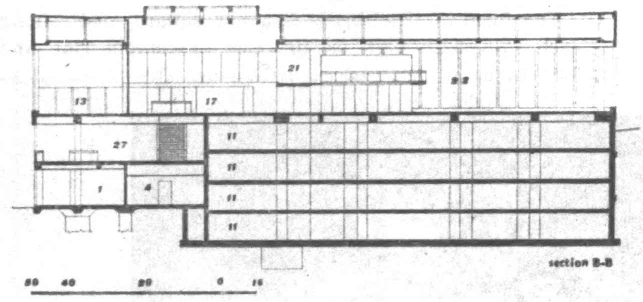
The book-stack, which has accommodation for 870 000 books on four tiers, lies immediately under the main reading-room. Access to the stack, however, except for a small area on the top tier which is available for future extension of the reading-room book-store, is used only by the librarian's staff and is not readily accessible to readers.

The basement stack and the floors below the main reading-room floor are in reinforced concrete. The floors in the book-stack are in plate construction with no beams, and each floor carries the bookshelves of that particular tier only. This construction was preferred to the more usual type of steel stack partly on account of the fire regulations and partly, as the stack is largely below ground, so that the floors could act as buttresses to the perimeter retaining-walls. The upper part of the building is framed with steel with 8ft. deep lattice girders spanning the 80ft. width of the main reading-room. Externally the horizontal bands above and below the principal floor are faced in Portland stone. The non-structural steel mullions forming the window-wall are faced externally with black-painted aluminium. The principal window-mullions to the ground and mezzanine floors on the campus elevation are box-section steel pillars. The north, south and west facades below the main floor-level are faced with dark blue-brown bricks.

The basement book-stack and the principal reading-rooms are fully air-conditioned. To reduce the cost, as much air as possible has been recirculated, although fresh air is introduced into the stack to the extent of 10 per cent., and in the reading-rooms at the rate of 1,000 cu. ft. per reader place. To ensure that the books in the stack neither deteriorate from mildew nor become over-brittle, the relative humidity never exceeds 65 per cent., a requirement which alone demands refrigeration. The air in the stack is distributed by vertical ducts which form the metal uprights of the book shelving and which are connected to the main horizontal distribution ducting in the false ceiling above the top tier. All the external walls of the stack are insulated with cork and there is a heating coil at ceiling level on each tier. In the reading-room, to reduce solar glare and



section A-A



section B-B

key
1, entrance hall.
2, cloakroom.
3, processing room.
4, dark room.
5, stationery store.
6, strong room.
7, cleaners.
8, lift.
9, mess room.
10, lavatory.
11, book stack.
12, post-graduate reading room.
13, periodicals reading room.
14, binding and unpacking.
15, cataloguing.
16, labelling.
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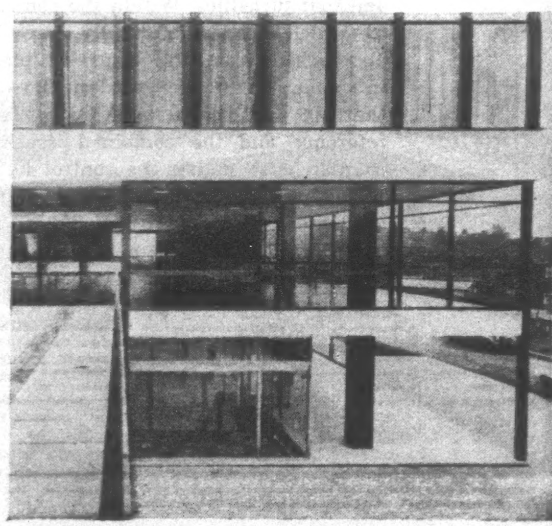
23, female staff common room.
24, male staff common room.
25, kitchen.
26, air-conditioning plant.
27, mezzanine exhibition space.
28, pamphlet room.
29, thesis room.

to reduce the demand on the refrigeration plant, windows facing south and west are glazed with double anti-sun panels. All rooms which have air-conditioning have fixed windows and only those relying solely on radiators and convectors have opening lights. The ceilings of the reading rooms are of pierced aluminium panels which are clipped to the heating coils, above which is a layer of insulating and sound absorbent material.

Lighting in the reading-rooms is by flush fluorescent fittings which can be lowered to allow ease of replacement. The catalogue-hall has an overall corrugated plastic translucent laylight, above which are fluorescent lights at high level.

8, the entrance corner, showing the mezzanine floor inserted below the main library floor, alongside the upper tier of book-stacks.



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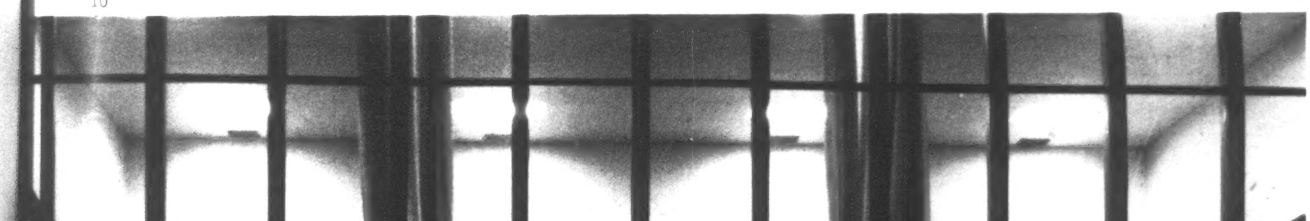
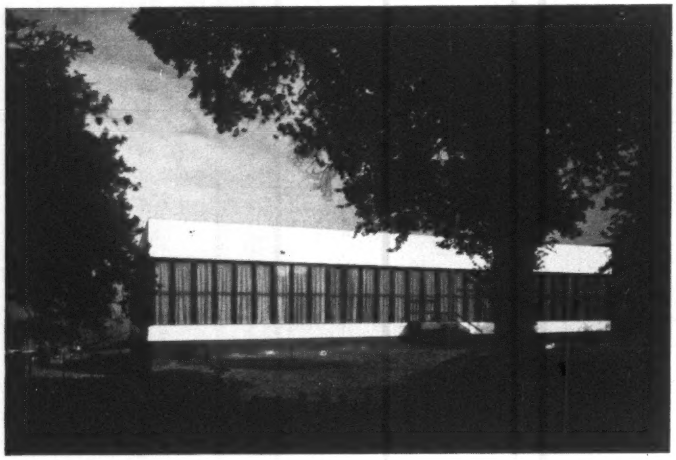
9, close-up of the main entrance (edge of mezzanine floor-slab faced with Portland stone; vestibule lined with Piastraccia marble).
10, looking through the entrance façade, lit up at night.

10





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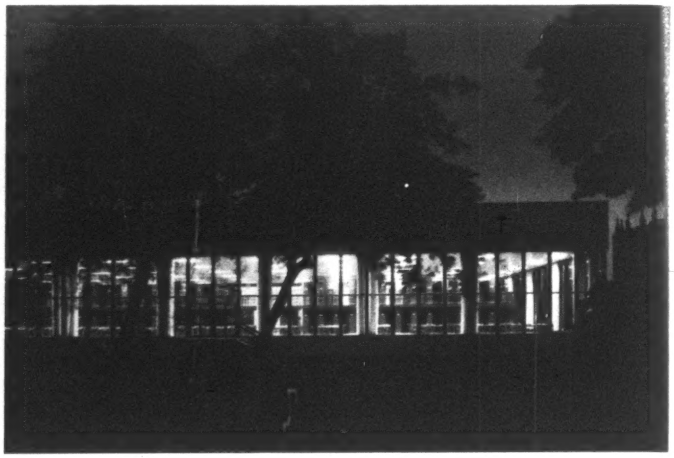

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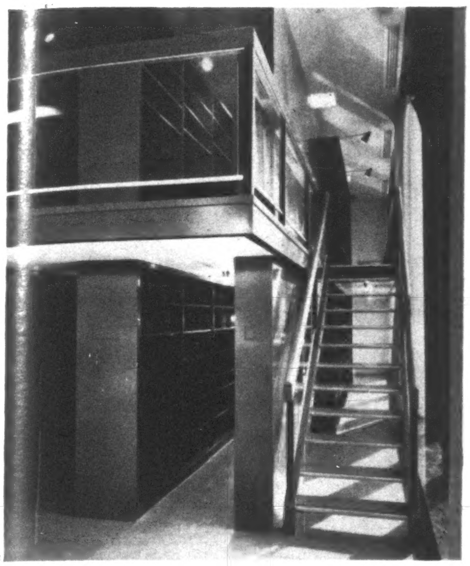
The reading room. 11 and 12, exterior by day and night (at this side of the building, facing Weston Park, the first floor is only a little above ground level).
13, interior. On the right is the balcony containing open-access bookshelves beneath which the reading room is reached.

13



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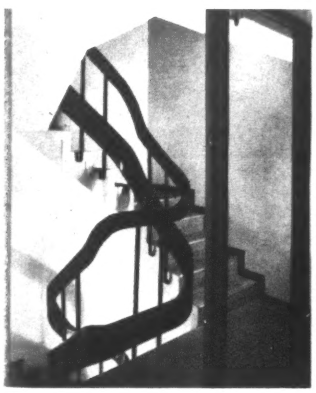
14, one of the staircases leading up to the book-store balcony (see facing page).
15, looking into the main reading-room beneath the same balcony.
16, the post-graduate reading-room, occupying the south-east side of the first floor. All reading-rooms have floors of grey linoleum.



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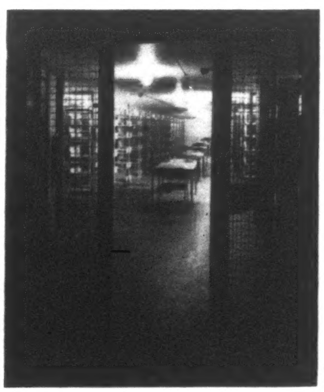
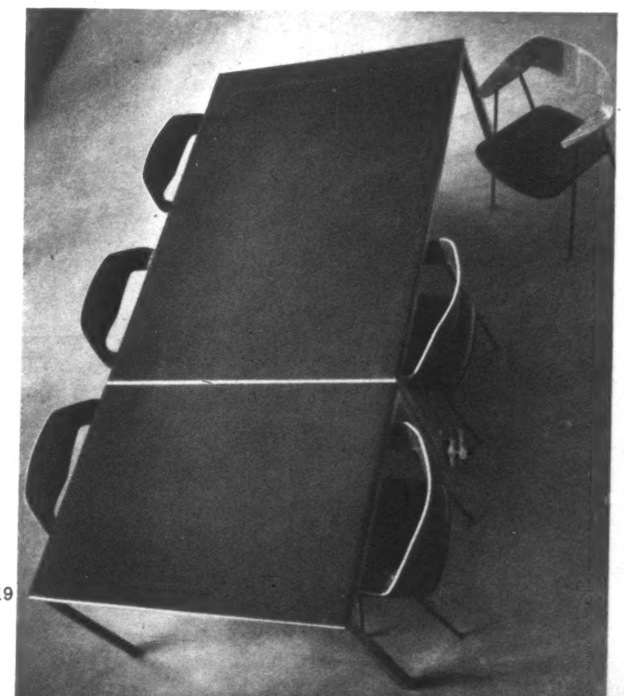


18

:7, one of the staircases leading down to the successive levels of the ›ook-stack.
:8, inside a typical book-stack. These are in four tiers, occupying he whole of the south-western half of the building below the 'eading-room level.
:9, the standard table and chairs used in all the reading rooms. They iave a metal frame and the table top and chair seats are covered vith black imitation leather; the chair backs are of tola.



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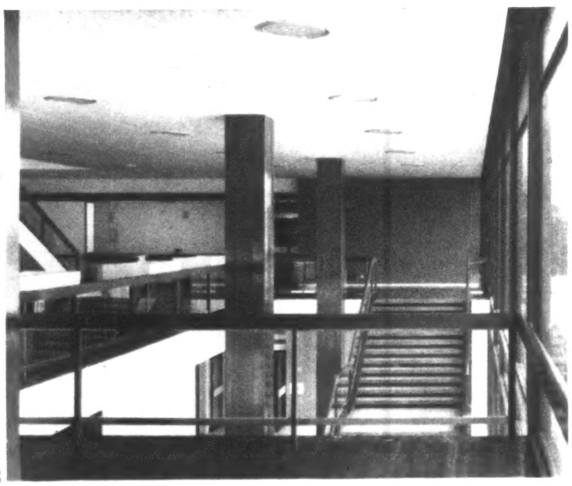

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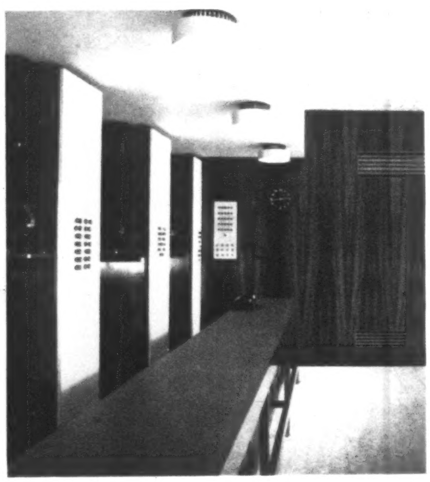

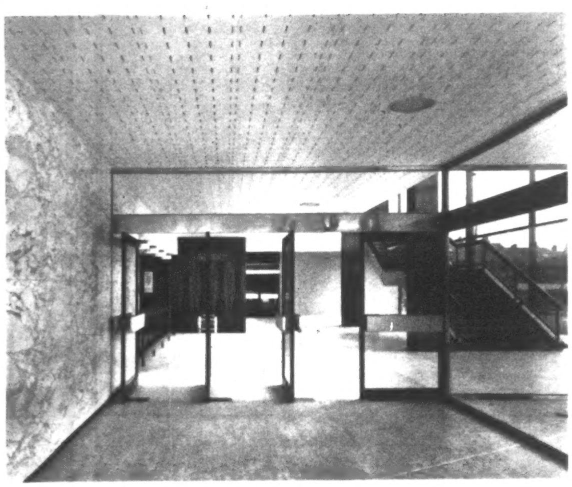

23, 24

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20. the catalogue hall on the main reading-room floor. The catalogue cabinets are at the far end. the entrance to the reading-room beneath the book-store balcony (see 13, 14, 15) is on the left beyond the library counter, and the staircase leading up from the mezzanine floor in the centre. The wall on the right, separating the hall from the periodical reading room, is faced with Danish maple.

21. the main staircase at mezzanine floor level. It has laminated wood treads on cased steel bearers. The balustrade is metal with glass panels, the handrail mahogany.

22. looking past the foot of the staircase towards the main entrance, showing also the mezzanine floor. The floor is travertine. The columns are faced with aluminium with a black sprayed cellulose finish.

23. cloakroom in ground-floor entrance-hall. The far wall is faced with Macassar ebony.

24. looking into the entrance-hall from the vestibule: on the left the cloak-room seen in 23; on the right the foot of the main stair.

James Gowan

CURRICULUM

The continuing debate on architectural education has just received an important official contribution in the publication of the report of the RIBA committee to consider the recommendations of the Oxford Conference of 1958. The report, like many official documents of its kind, is chiefly concerned with the educational standards of those who enter architectural education, and the professional standing of those who emerge from it. But what of the educational process itself? In his article below, James Gowan—who as student and teacher has experienced most of the current educational techniques—approaches architectural education from the entirely different standpoint of asking what aspects of architecture can reasonably be taught in schools, and offers both a model curriculum that could be put into effect here and now, and illustrations of the kind of work it could be expected to produce in each year.

Any discussion on architectural education today becomes immediately involved with Bauhaus principles. For over 20 years the progressive schools in this country and others have based themselves on Gropius's theories on architecture and study, and many continue to do so in the belief that the system has certain fundamental values which can survive indefinitely without adjustment. However it is evident that, in the more advanced schools, this is not the case and a large gap exists between what is taught and what is thought.

It is important to recall that the Bauhaus had two primary aims, both of which were accomplished. One was a reaction against the 'styles' and Beaux Arts academism. This initiated a teaching procedure based, fundamentally, on economic essentials; the decorative, the superfluous, the irrational, were eliminated. The second aim was to establish a particular kind of architecture which Gropius describes in 'we want to create a clear, organic architecture, whose inner logic will be radiant and naked, unencumbered by lying façades and trickeries; we want an architecture adapted to our world of machines, radios and fast cars, an architecture whose function is clearly recognizable in the relation of its forms.' The reaction predetermined, and the manifesto defined, an architectural style; the architecture of the Fagus factory and the administrative building at the Cologne Exposition. And teaching experiments in this country (the post-war school at Kingston-upon-Thames) have shown that similar teaching will produce a similar architectural style.

At the present time most schools are operating in an academic vacuum, that is, the students are developing privately and on their own initiative. The problem is, once again, to relate the content of teaching to a stated architectural aim. This will necessarily be retrospective and academic as a school can only

directly teach digested opinion and *indirectly* create an atmosphere which is concerned with anticipated and unrealized objectives.

It is becoming apparent that architecture, mainly due to economic pressures, is becoming multi-aesthetic; that is, not *one* style but a number of styles, each appropriate to the particular problem, are developing. For example:—

The 'house' is deeply rooted in *traditionalism* and, because of the wide variations of owner-requirements and limited finance, it is likely to remain so.

[*continued on page 323*

CURRICULUM

Two parallel streams of study form the skeleton of this model curriculum. First, the 'environmental'; this is concerned with the structure (social, cultural, etc.) of our communities. Second, the 'technical'; this is concerned with the physical means available to the architect.

The 'environmental' stream commences in 1st year with simple studies of human dimensions (design of furniture and basic equipment) and human activities (work studies and layout of rooms in the home) and ends with the design of a single-cell dwelling.

In year 2, the subject of study is a village, in which new building is taking place, and problems of relationship between new and old exist. Groups of 4-6 students carry out a visual investigation of the area, the primary concern being chiefly topographical at this stage; ground levels, position of trees, surface materials and the location and description of the principal buildings. This information is recorded for subsequent reference. Sites are then selected for a realistic programme of buildings which is as representative as possible; a house, a public building (village hall), a commercial building (shops) and an industrial building (workshop or garage). These are then carried to final design stage by individual effort.

Years 3, 4 and 5 follow the same pattern; a site research, development proposals, the design of housing and a typical range of public buildings. The town (year 3), the city sector (year 4) and the city (year 5) reiterate the problems but expand the scope of the enquiry and each are studied in a progressively more thorough and acute manner.

The 'technical' stream begins, in Year 1, with three studies using limited construction techniques. The elements are 1. linear (scantlings), 2. plane (sheet glass, plywood) and 3. solid (stone, concrete blocks) and the jointing technique to be used is stated. Simple problems, such as 1. small span bridge, 2. screen system in an enclosed space, display on screens, 3. garden shelter or walling layout, have a threefold use. They state a functional problem, they require three-dimensional consideration and they indicate that each type of element exerts its particular discipline. This work has to be based on accrued, empirical experience, as the technical lectures do not advance sufficiently until year 2. Then, until year 4, one design problem is undertaken with each of the materials; timber, masonry, steel, in situ concrete and precast concrete. The intention is to cultivate a greater degree of general competence and to concentrate attention on the limitations and the potentialities of basic building techniques.

The two parallel streams are a fairly adaptable system, in an educational sense. The 'environmental' progression of individual . . . city provides a realistic basis for the general advisory lectures; sociological, legal, cultural, etc., and substitutions can be introduced into the sequence as more important problems arise. There is an argument, now, for studying suburban growth instead of the village and such a change could be made without disrupting the continuity.

The 'technical' stream has the same adaptability to change. With its design studies in particular building materials, it provides the spine into which the specialist technical lectures are introduced and the design studies themselves cultivate a need and a demand for technical information.

	technical stream		environment stream	
student directed to a member of the society or association for extra-curricular and general professional information				
maths physics chemistry structures principles of materials principles of building	basic design studies with scantlings, blocks, sheets post and beam draughtmanship, perspective, typography individual construction of furniture	**1**	human dimensions (equipment and furniture) work studies (room planning) visual research single-cell dwelling	work method modern history lectures
design lectures on each building material sanitation, heating, ventilation, lighting, services	timber building masonry building individual construction of furniture	**2**	village study: research programme design of buildings: 1. housing 2. commercial 3. industrial 4. public landscape design	information and specialised lectures phased to precede programmes history and general studies
contractors organisation, plant, requirements, and building equipment. office experience in summer vacation and winter term of year 4	steel building insitu concrete building individual construction of furniture	**3**	town study: research programme design of buildings: 1. housing 2. commercial 3. industrial 4. public history essay	history and general studies
technical information visits and lectures phased to precede design programmes colour	glass building precast concrete building individual construction of furniture	**4**	city sector study: research programme, design of buildings 1. housing 2. commercial 3. industrial 4. public landscape design	history and general studies
professional practice legal and financial aspects of land and building	individual construction of furniture	**5**	city study: road and city growth city building history essay	

The next five pages illustrate, either with student-work or other material that is comparable in intention, the kind of design-schemes, research and practical exercises that would make up a five-year course following the model curriculum set out above.

year 1

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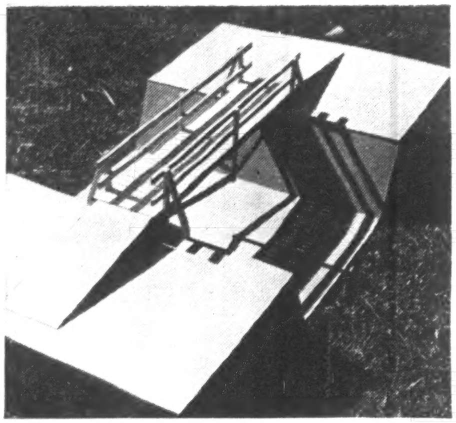
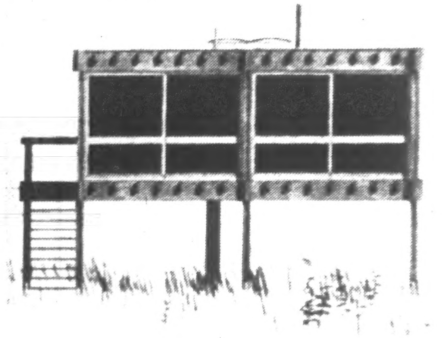
3	8
4	9



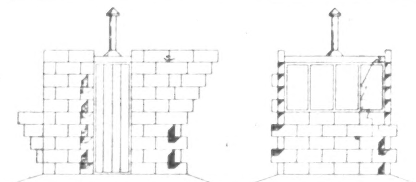


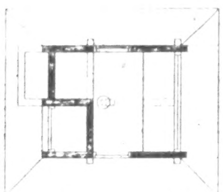
ISMUS IN HOLLAND

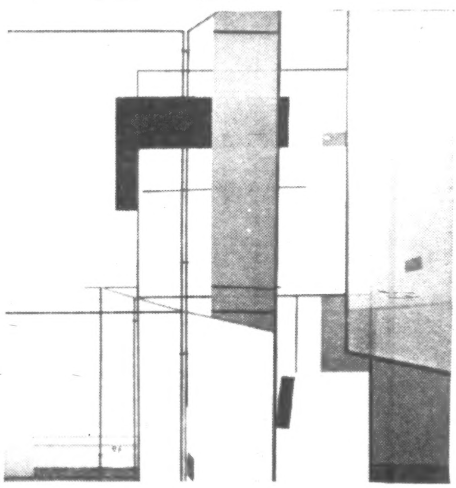
DADA

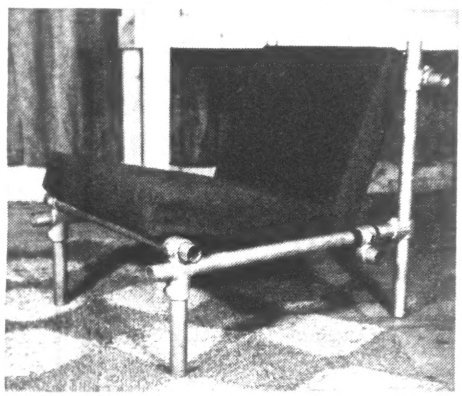
in Holland ist ein Novum. Nur ein Holländer, I. K. BONSET, ist Dadaist. (Er wohnt in Wien.) Und eine Holländerin, PETRO VAN DOESBURG, ist Dadaistin. (Sie wohnt in Weimar.) Ich kenne dann noch einen holländischen Pseudodadaisten, er ist aber kein Dadaist. Holland aber,

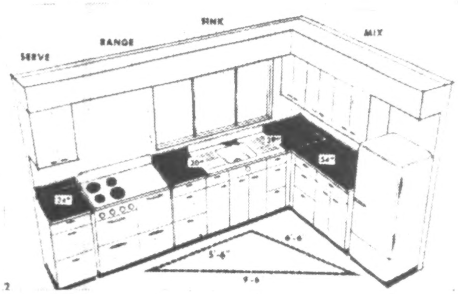
HOLLAND IST **DADA**

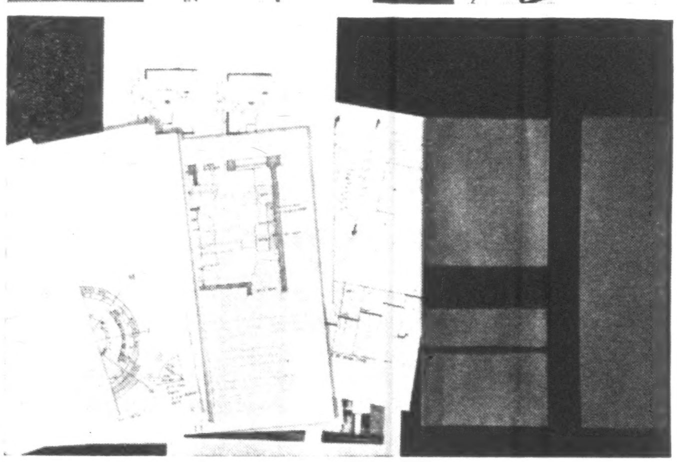


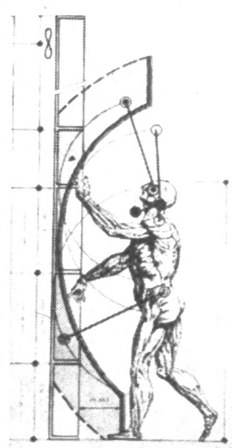












1, the timber bridge spans 20 ft. and uses one size of scantling throughout, 4 in. by 2 in. It is an exercise in simple triangulation in which the elements, the walkway, the handrail, and the structure are interrelated geometrically and are interdependent structurally.

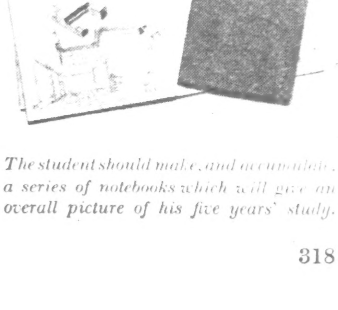
2, the garden hut, an exercise in concrete block construction, houses fuel, garden tools and a work bench. The walling, in one instance, is corbelled to incorporate eye-level shelving and, in the other, to form a fuel hopper. Transverse walls are articulated by projecting the bonding blocks.

3, demountable screen systems are one way of posing the problem of frames, joints and panels: the whole being structurally self-supporting. The scheme illustrated is not concerned with the problem of display (which is intended in the curriculum) and stresses the system itself.

4, 5, 8, 9, the subsequent studies are basic research leading to the design of a single cell dwelling, 5. This includes human dimensions, 9, furniture dimensions, study of kitchen use, 8, equipment layout and technical standards (space, light, ventilation, etc.). 4.

6, a section of Kurt Schwitters typography is included to symbolize these studies, which are to be included in the First Year course, and to act as a reminder that the bulk of contemporary typography has drifted a long way from its function of imparting information clearly and effectively.

7, during each year, as a practical exercise, the student makes a piece of furniture for his own use. He must devise, construct and test the object himself. The example illustrated is made of scaffolding, strip and foam rubber—and challenges you to like it.



The student should make, and accumulate, a series of notebooks which will give an overall picture of his five years' study.

year 2

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11 | 16
12 | 17
13 | 18
14 | 19

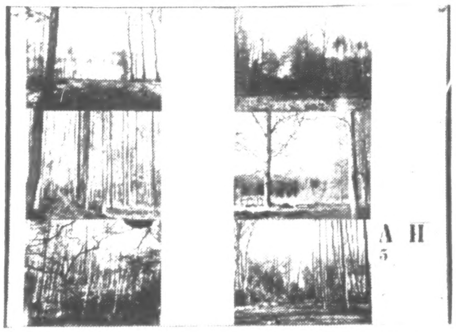
10-14, at its best, a second year scheme at village scale should be preceded by a particularly thorough, well-documented research. This scheme began with photographing the site, recording materials, colours, road surfaces, plant life, etc.; the concern being entirely with visual things. The artist's house and the village hall (which were the subject of the design studies) are sited in this village and the relationships with existing surroundings are clarified by a model.

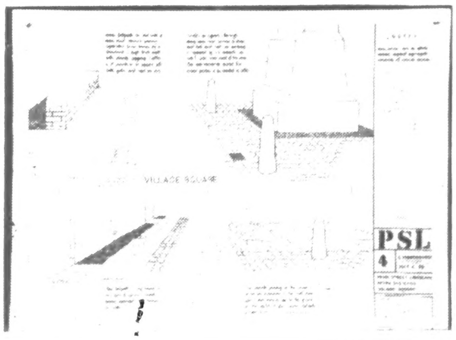
18, the village hall is the timber study; built in posts, trusses and panels. The bolted, structural joints have been carefully considered and a positive, pleasant interior results.

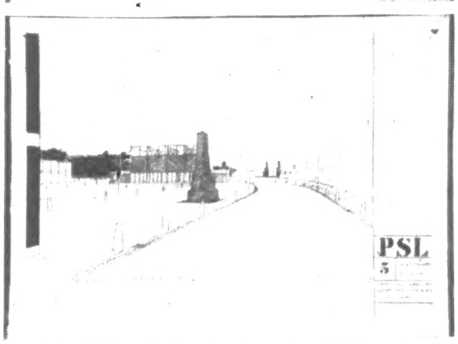
19, a full dress perspective study, required as an exercise in this year, based upon the artist's house in Woodward's scheme.

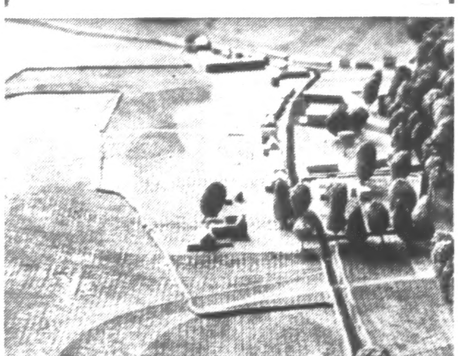
15, 16, this brick building is a holiday camp arrangement, small rooms sharing central dining facilities, etc. This has produced a cellular, rather over-generous plan, but the brick is aptly used in a vertical, load-bearing manner. Practically, the building is neat and competent, but a contradiction is apparent between the formality of the original idea and the picturesqueness of the final result.

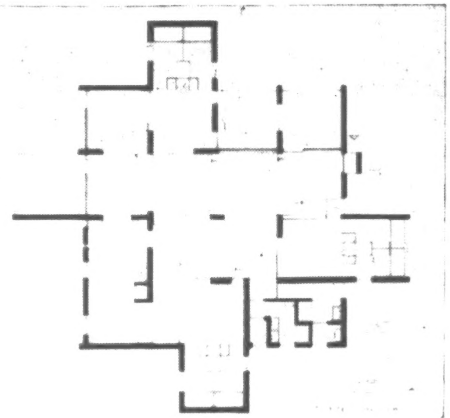
17, the problems of deviations within the programme are exemplified by this block building, representative of a prevalent, minority point of view which sees architecture directly in an historical continuum and interprets this situation literally. The coping, lintols and string courses are applied without re-assessment or thought, to a contemporary problem such as is often set in schools, and the result is so far removed from function that it is virtually decoration. This is a boiler house (not a chapel) in concrete blocks (not stone) but—legalistically speaking—it answers to the letter of the programme, as set.

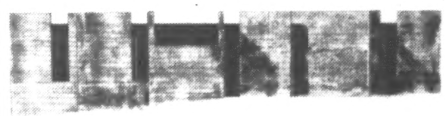


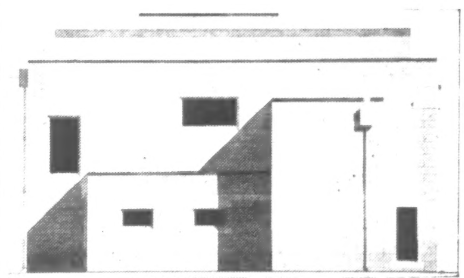


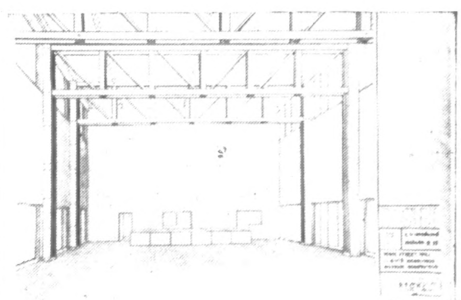




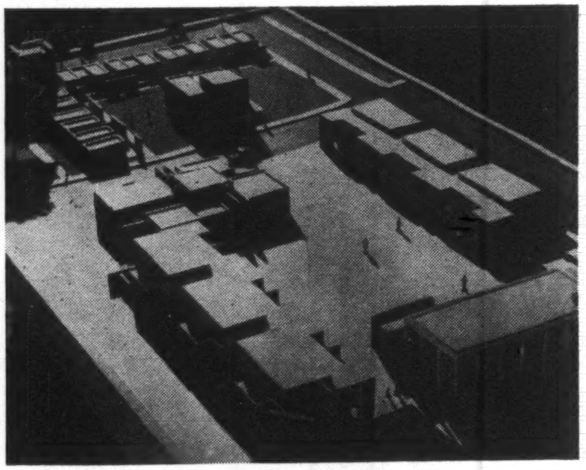


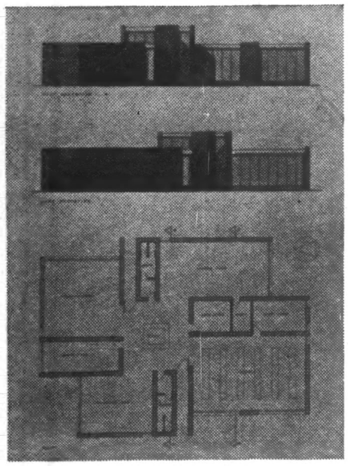


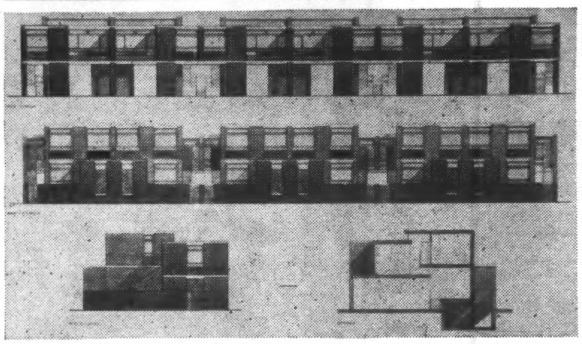


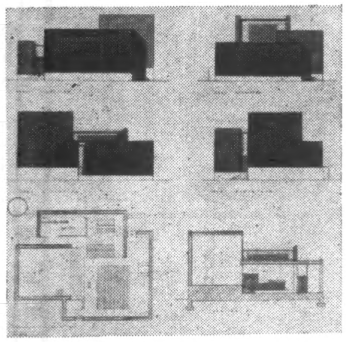


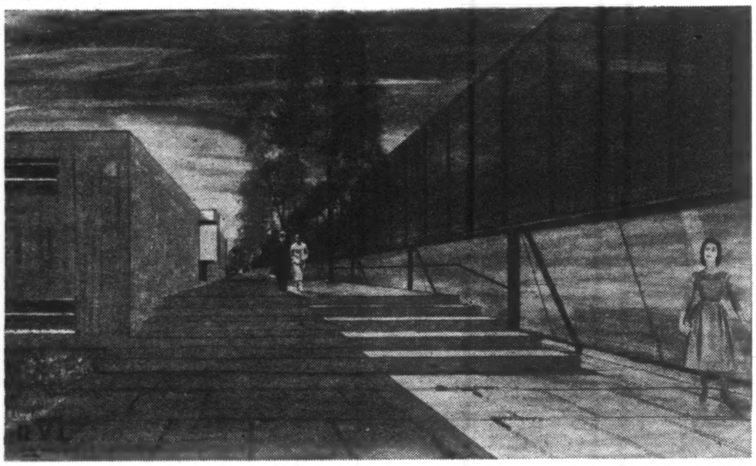
year 3

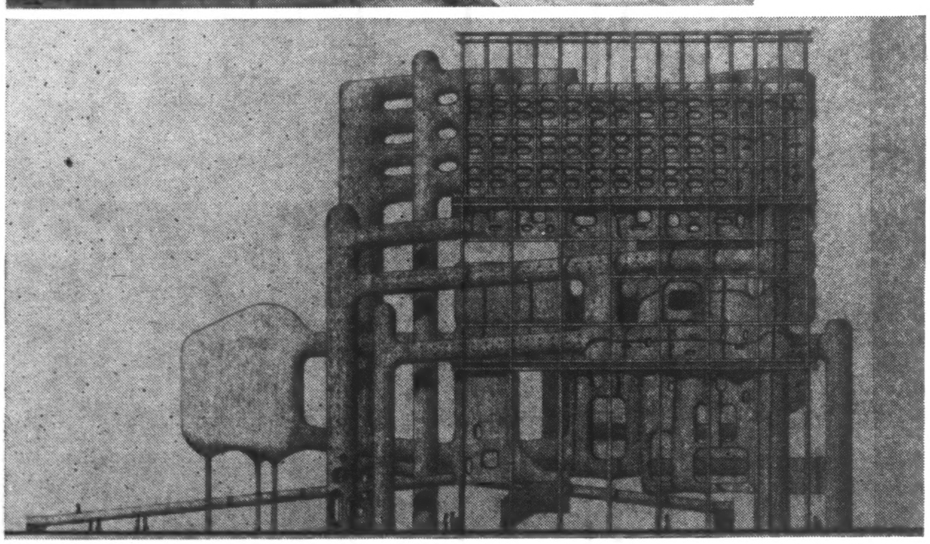












20 | 21
22 | 23
24
25

20, *a town centre, such as this, provides a good example of a small group of students working together and producing a unified result. Planning decisions were made together but the buildings were designed individually using agreed materials: blue brick, concrete and glass.*

21, *the library was one of the best things about this group of studies; the control has been given the key central position and round this the reading rooms rotate.*

22, *there is little system, however, about the stores which are sometimes solid, sometimes glazed once, sometimes twice; and the entrances seem unduly restricted. However, they harmonize with the other town-centre buildings in structure and style.*

23, *the chapel (from the same study) is an exercise in three simple volumes and has an emphatic quality which is immediately appreciated. It is reminiscent of the* 1923 *house at Rotterdam by J. J. P. Oud—which is a pleasant enough thought.*

24, *a steel building, is a required exercise in the third year, and this one is an envelope to cover, and to exhibit, Roman remains. It is a fluent, skilled piece of work and the presentation is as good as one could expect in Year* 3. *There are strange things, however. It looks like a two-storey building (whereas it is a single volume in fact) and the provision for viewing inside it seems almost incidental and unimportant.*

25, *the Furniture Manufacturers Association showrooms is a particularly fine example of the work done recently at the Regent Street Polytechnic and their rather specialized preoccupation with structural techniques. On the lower floors are the firm's offices, the auditorium is poised by the ramp, and the top floors are lettable offices. The building is of* Ferro-Cimento *supported by a precast concrete frame which seems to be structurally redundant. It is probably essential, visually, to impose an architectural order on what might otherwise be mistaken for automobile engineering and everything is so openly stated that one can see at a glance the long circulation routes.*

year 4

26 | 27
28 | 29
30 | 31
32 | 33
34

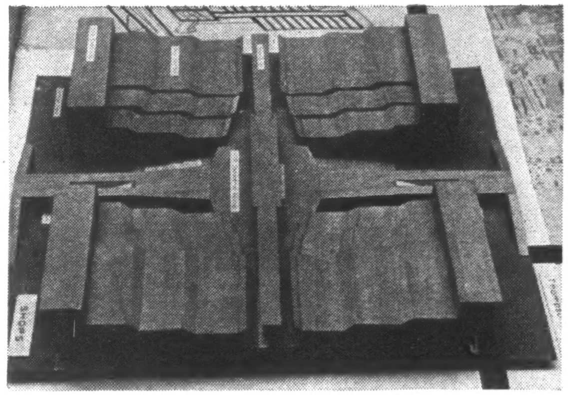
26, 27, 28, this Westminster scheme (on the metropolitan scale required in fourth year) is bounded by Parliament Square, Victoria Street, and Victoria Station and has St. James's Park on its north side. In this futurist-flavoured layout the city worker arrives at the station and is taken by travellator through the shopping, 26, to the small professional or the large commercial offices. In the remaining greenery, which is linked to the Park, stand the large stunted 'castles,' 28, which contain luxury flats built round a central service court. The result is a clear image of the students' intention, which is basically a zoning idea. Victoria Street, which is a rather dead shopping area, receives wedges of new shops, with rear servicing, on both sides of the travellator system, 26. The residential area is placed next to the Palace and the commercial area adjacent to Parliament Square.

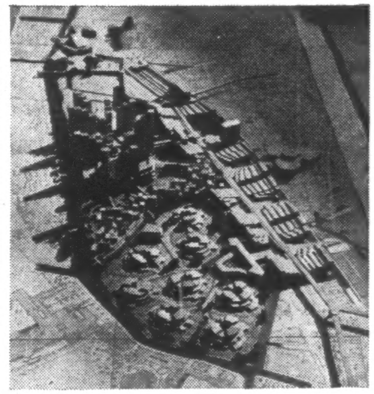
29, 31, a tapering block of luxury flats from another scheme for the same area. The steps diminish with the size of the flat and form terraces overlooking the Park.

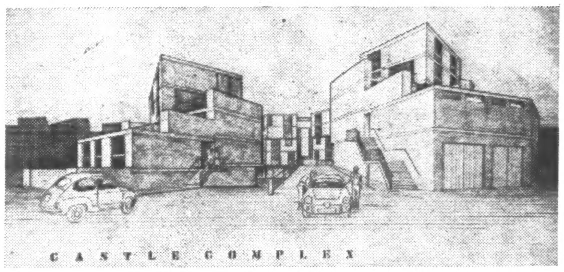
30, a cinema which effectively integrates display technique with its built form, in a manner that derives from the current student interest in pop-art imagery, as well as ideas on the integration of the arts.

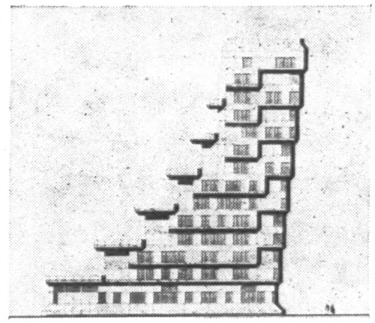
32, the bed is a good example of student/user design. It is made of steel tube, the legs terminate in large ball bearings, and it is sprung with unequally spaced strip rubber secured with copper rivets and washers.

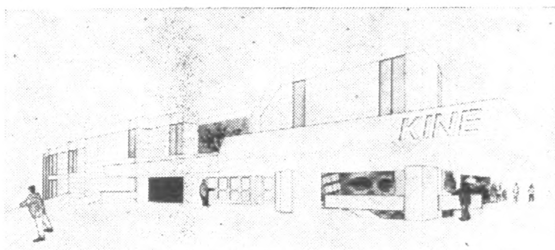
33, 34, the concert hall, in precast concrete panels (precast concrete is a fourth year subject) is part of an aggregation of buildings which the student-designer felt had its own animal identity (a recognizable head and so on). He has been fairly successful in producing simultaneously a rather good building and an armadillo.

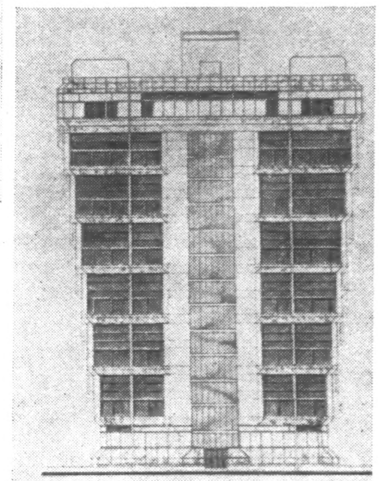


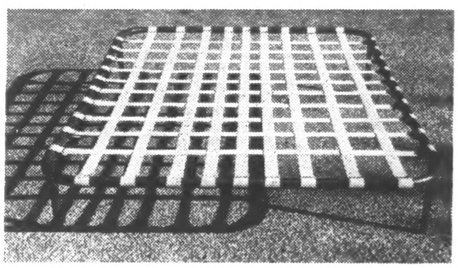


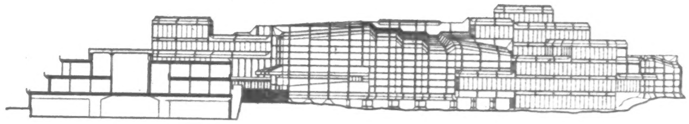


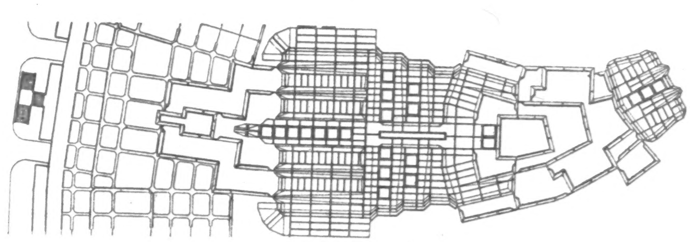


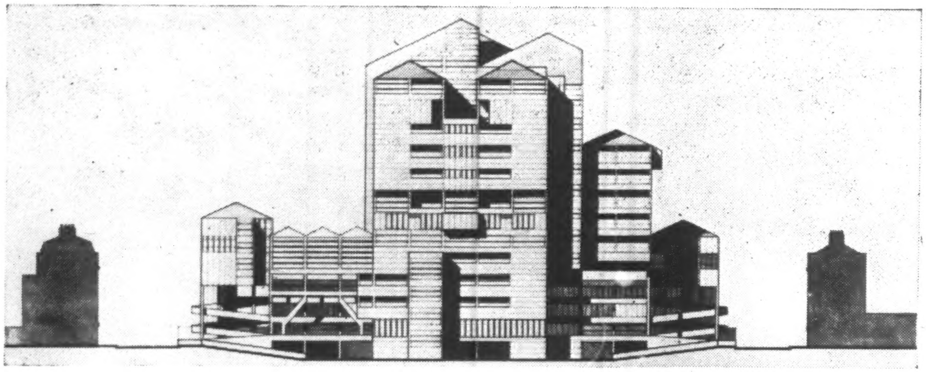


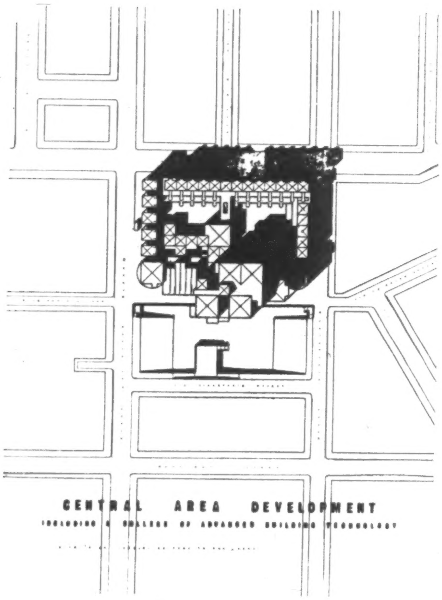


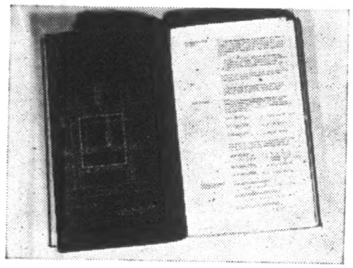


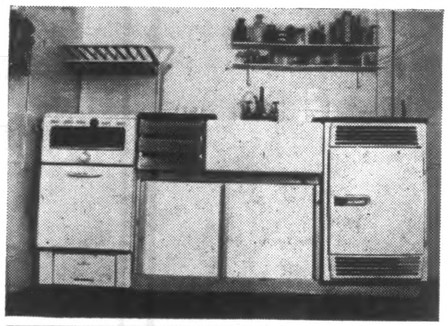


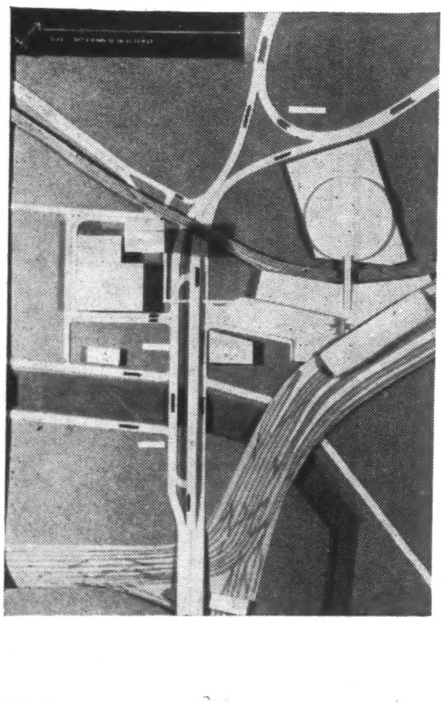


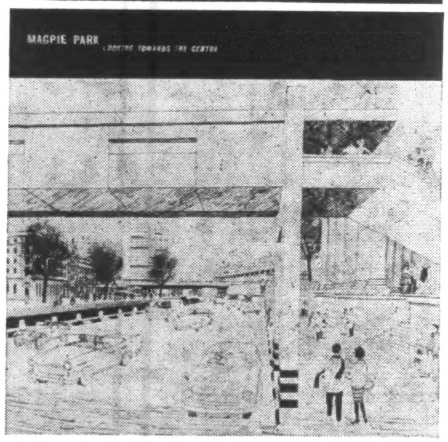












year 5

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36 | 37
38
39 | 40
41

35, 36, a central London redevelopment project for a school of advanced technology (architecture, building, surveying and engineering), residential accommodation, shops, commerce and light industry—a fifth year thesis-subject by Michael Haskell of Regent Street Polytechnic.

The school is located in the large tower, the shops on ground level, commerce and light industries on the basement and lower floors and hotel accommodation on the north and last sides of the site. On two corners of the site are car ramps towers which feed each end of two floors of car parking. Lecturers' accommodation, maisonettes and flats, are sited on the west side.

37, Haskell's design is accompanied—as it should be—by a thorough, considered report containing photographic reductions of the drawings. It is a most capable scheme, but two doubts remain; the artificial lighting and ventilating of all the commercial and light industrial floor area (124,000 sq. ft.) and the use of a steel frame structure with panels of pink anodized aluminium. It looks like, and would probably be better in fact in, precast concrete.

38, the culmination of the furniture construction programme; the integration of mass produced and purpose made units in a single structure.

39, 40, 41, road planning and central areas scheme for Bristol—the work of a post-graduate group at the Royal West of England Academy—primarily concerned with an improved traffic system. This is broken down from the regional trunk roads, to those linking central areas, to local roads. Traffic is brought quickly into the centre and parking provided. Above this a pedestrian platform is formed and shops, flats and offices are directly accessible from it. The scheme was costed, exhibited and publicized energetically, but was eventually turned down by the local authority. Nevertheless, independent research of this kind can only be undertaken by schools, but when it is sufficiently realistic and immediate, it usually has some effect outside the school itself.

continued from page 316]

Technology infiltrates, most slowly, into the house via the components (doors, windows, flooring, etc.) and the mechanical equipment.

The commercial block with its simple repetitive accommodation is ideally suited to the *standardization* of components; the structural elements, cladding, partitioning, equipment and furnishing.

The industrial problem, power station, oil refinery, etc., is constructed directly and functionally in the *engineering* tradition of ships and railways.

The spiritual problem, the church, which has not yet been solved by dedicated functionalism, has responded to a more *personal*, indeed, emotional approach.

In addition, each constructional material exerts its own particular discipline. Each has certain structural, functional and plastic limitations which are unique and characteristic. Examples like the *brick* Liverpool warehouses, the *glass* Palm House of Decimus Burton, the *timber* bridge of Palladio and the *concrete* Governor's Palace of Le Corbusier indicate the extensive range and divergency of expression which result from this premise.

Architecture is generated by order; this is a synthesis of the brief, the site, the technical means and the plastic intention. Architecture is the organization of these things. In this order, geometry is of significant importance and is fully realized when it integrates, simultaneously, structure, space, function and the plastic idea.

Architecture is concerned with the form and growth of our environment, villages, towns, suburbs and cities, and the methods by which each of these structures can change or adapt itself to today's needs. Within these structures a hierarchy is developing in which each type of building (residential, commercial, industrial . . .) has a distinctive form as a result of its function, an appropriate location as a result of convenience and a symbolic emphasis as a result of its importance.

City building, in London, has shown the meaningless confusion of building individual blocks without a constructive regard for the cumulative result. The post-war satellite towns demonstrate the same consequences when old planning concepts are used to solve new problems. Both show clearly the limitations of conventional town planning techniques and their failure to provide an acceptable environment. It is certain that creative solutions are only likely to come from architects and the schools, indeed, in other countries Aalto, Le Corbusier and Kahn are already involved with the complex problems of building today's cities and towns.

This dissatisfaction with man-made environment is felt outside architectural circles. William Molley Whyte, in an article which describes a great many functional deficiencies of our cities asks: 'And how are our architects and planners responding? With superb technical ability and a truly remarkable unity of approach, they are freezing on a design for living that is the antithesis of everything the city stands for. Typically, the new projects consist of a series of high-rise tower apartments set in geometric patterns on an abstract green space carefully preserved against human encroachment. The results are not 'cities within cities,' but anti-cities, and it is characteristic that they are sealed off from the surrounding neighbourhoods as if they were set in cornfields miles away.'

Whyte's comment is fair. The tower blocks in the landscape, the Ville Radieuse, is still the image for most high density housing schemes and Le Corbusier's Utopia has been reduced by adaptation and modification to lean, minimum essentials so that the results are now far removed from the fullness of the original ideal.

It is necessary to re-establish our aims, to define the forms we propose for our towns and cities. These large scale planning studies usually require a fairly extensive preliminary research, which is beyond the means of the individual architect or small office. But the architectural school is in a most advantageous position. By group effort, these involved problems can be assimilated and solved in a completely realistic manner.

Acknowledgments for the use of illustrative material are due to: the Architectural Association, London; The Regent Street Polytechnic, London; The School of Architecture, Cambridge University, and The School of Architecture, Royal West of England Academy, Bristol. The inclusion of schemes from these schools does not, of course, imply that they support, or employ, the model curriculum set out in this article. Restrictions of space have made it impossible to publish the name of every student concerned in the schemes illustrated.

THREE CHURCHES

The three recently completed churches illustrated on the following pages belong to three different denominations, a hopeful sign that the new life which at last is beginning to be apparent in church architecture in England may represent a general awakening rather than an isolated case or two of enlightened patronage. All three are inexpensive, but lose nothing by the simplicity this has imposed on them. To the great advantage of all three the architect has been allowed to design the furniture.

METHODIST CHURCH, MITCHAM

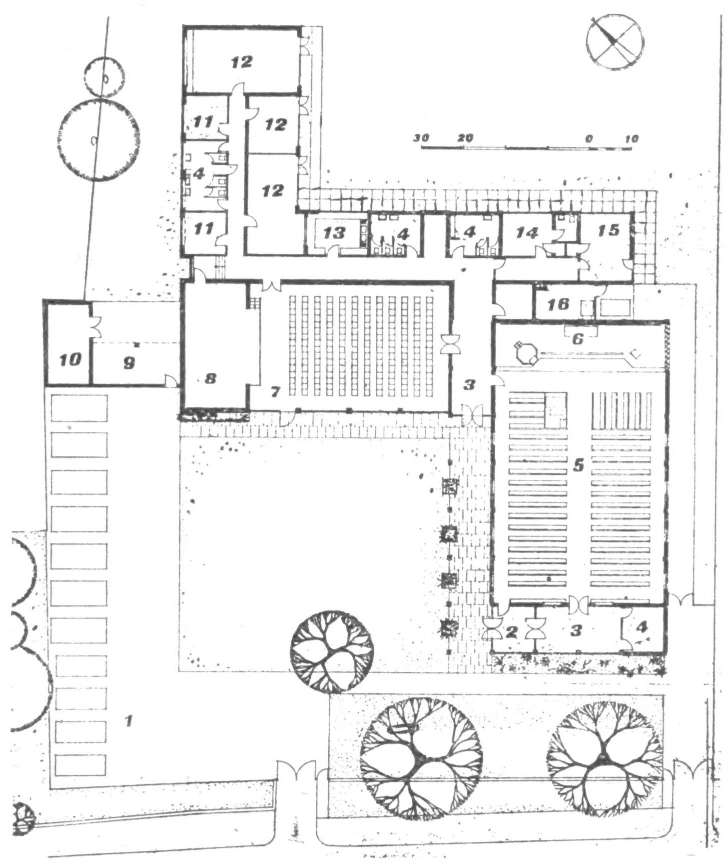
ARCHITECTS | **EDWARD D. MILLS AND PARTNERS**

On Mitcham Cricket Green: an L-shaped group consisting of a church to seat 300 (replacing a bombed church on a nearby site) and a church-hall with classrooms, etc., adjoining. There are gardens in front of and behind the building. The church has its own vestibule at the west end, but can also be entered from the vestibule of the hall, which is otherwise independent.

The hall is reached by a covered way along the north flank of the church. It seats approximately 200 and has a stage, three large classrooms, two dressing-rooms, and two vestries. Two of the classrooms can be made into one by folding doors and adjoin the kitchen, which has a service counter so that they can be used as a youth canteen.

The construction of the church consists of a reinforced concrete frame designed by Ove Arup and Partners with brick infill walls, hardwood windows, and a folded slab roof finished inside with timber strips. The hall and classroom block has load-bearing brick walls and timber roofs, covered with woodwool slabs and asphalte. Ceilings are acoustic tiles and windows softwood, painted. Heating is by hot air in floor ducts and can be independently controlled in different parts of the building. The church organ, which is in a loft over the entrance to the hall, has a remote control system linked to the console in the body of the church.

key
1, car park.
2, lobby.
3, vestibule.
4, cloakroom.
5, church.
6, communion table.
7, hall.
8, stage.
9, bicycle shed.
10, tool store.
11, dressing room.
12, classroom.
13, kitchen.
14, minister's vestry.
15, stewards' vestry.



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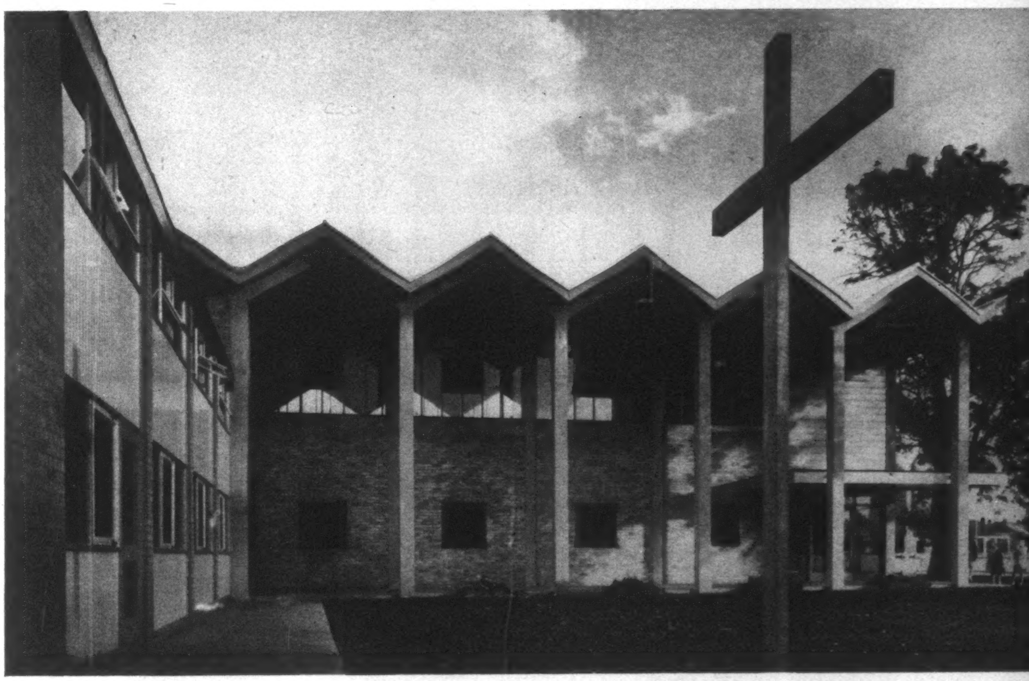


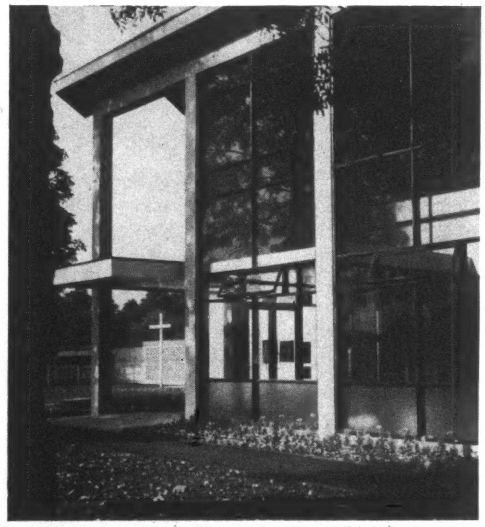
2

1, from the west, showing the covered approach to the hall along the side wall of the church. The concrete frame supporting a folded-slab roof has brick infill walls with small hardwood-framed windows below and large clerestory windows above. 2, the north-west wall of the church, with the hall on the left, both facing on to the same garden. The entrance from Mitcham Cricket Green is on the right.

3

4

METHODIST CHURCH, MITCHAM



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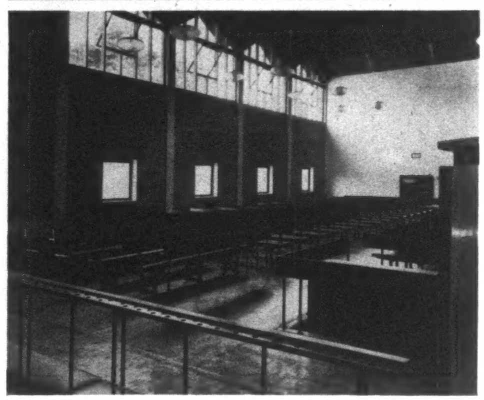
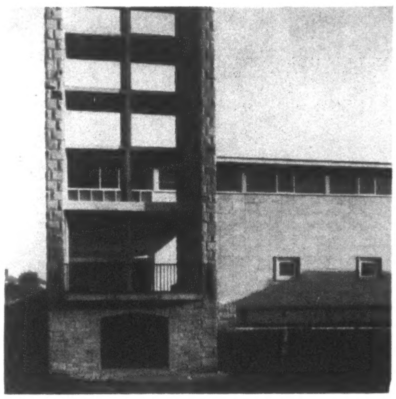


6

3, inside the church, looking towards the chancel. The end wall is faced with riven York stone and the ceiling with narrow strips of timber in a natural finish.
4, close-up of chancel, showing York stone wall and side lighting.
5, corner of church and covered way, looking north.
6, looking from the chancel, with a corner of the pulpit on the right.



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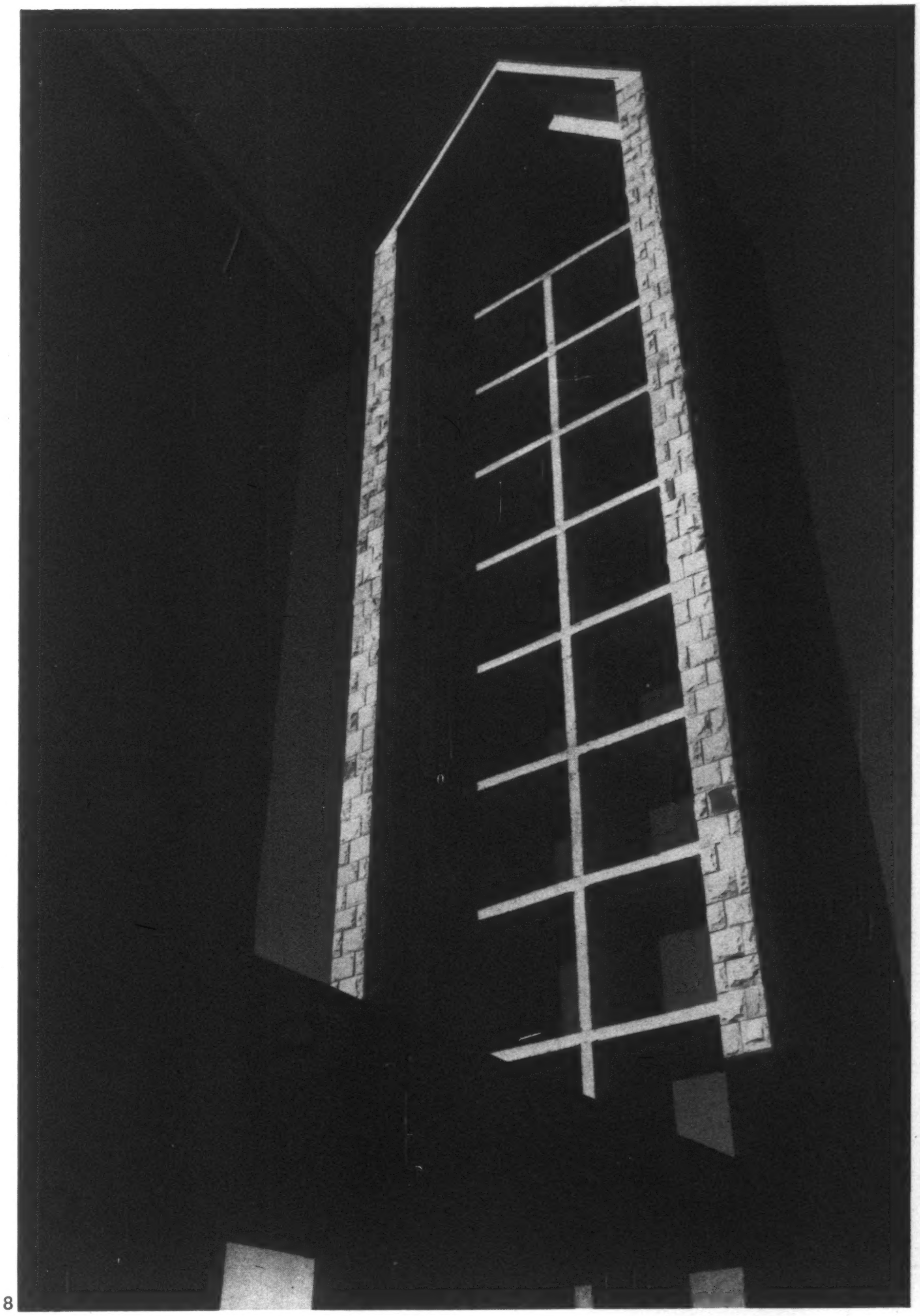


8

7, the foot of the tower, with the nave of the church beyond.
8, tower and connecting link to church, which serves as a canopy over the entrance.

ROMAN CATHOLIC CHURCH, LANCASTER

ARCHITECT	***TOM MELLOR***
associate architect	***Jack Waterhouse***
assistant architect	***David D. Silcock***

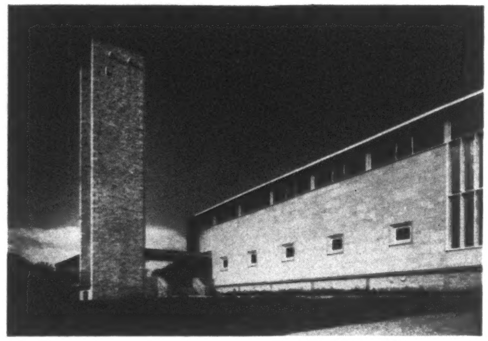
On the edge of a new housing area. The site is triangular, at the junction of three important roads, and the detached tower is designed to be seen from all three directions. The church is dedicated to Saint Bernadette.

Liturgical requirements and the need for direct vision and a close relationship between priest and congregation determined the equal width of nave and chancel, the raised chancel, the siting of the baptistery (at the south end) and the open screen between baptistery and nave. Chapels and sacristies are ranged along the west side.

ROMAN CATHOLIC CHURCH, LANCASTER

The reredos is by John Piper and the Stations of the Cross and baptistery crucifix by Peter Watts, who is also designing a large crucifix for the tower. The furniture was designed by the architect.

The tower has a reinforced concrete egg-crate frame; otherwise construction is load-bearing stone—that in the tower and gable-walls of local rubble and that in the main walls of ashlar above a rubble base. The ceiling of the nave is of open timber slats, strong enough to allow access to the light-fittings above it. It follows the line of the underside of the steel roof-trusses. A gap in the centre is spanned by two tension bars connecting the halves of each truss.



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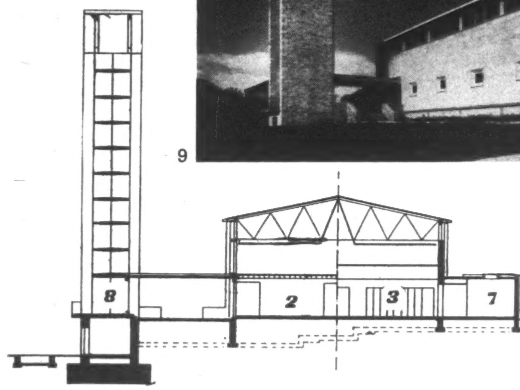
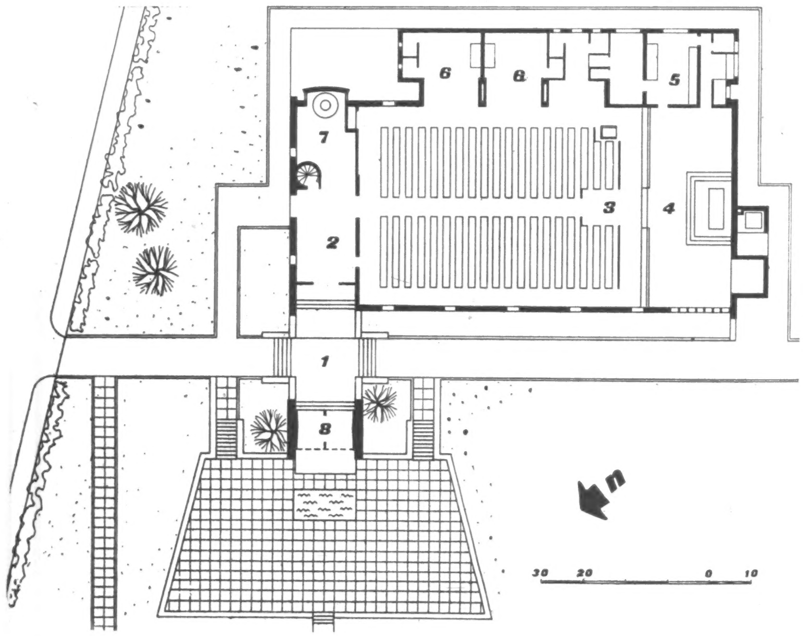


transverse section

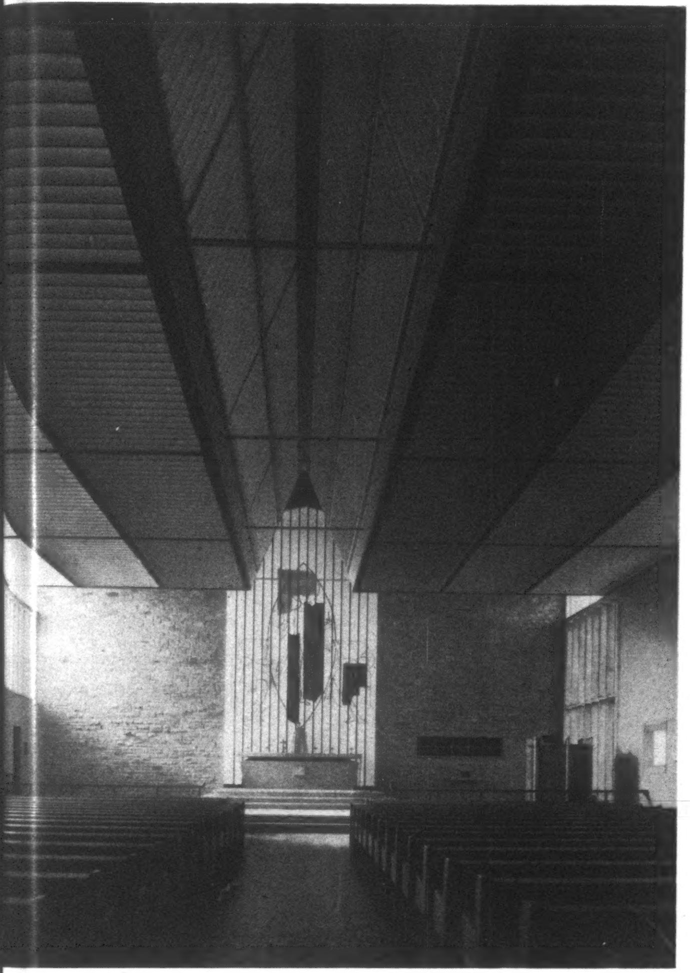
key
1. entrance
2. narthex.
3 nave.
4. sanctuary.
5. sacristy.
6. side chapels.
7. baptistery.
8. tower.

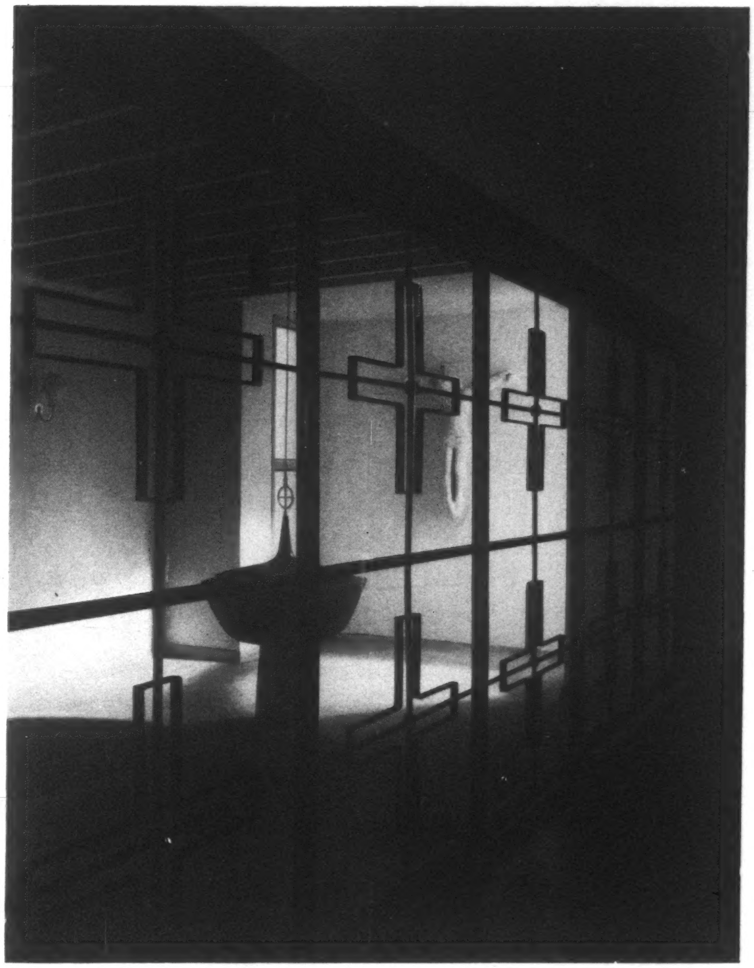


10

9 (top of page), south side of church and free-standing tower.
10, the altar, with reredos by John Piper.
11, looking towards the altar through the metal screen that separates the nave from the entrance narthex.

11



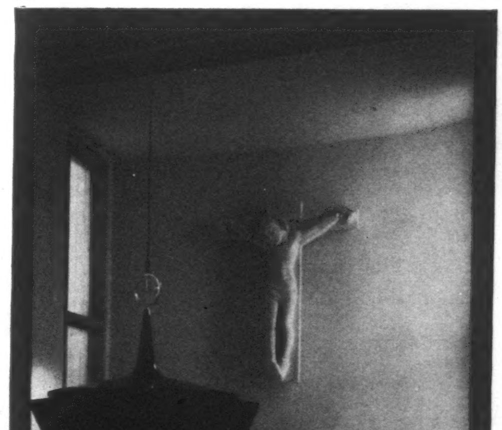


13

12, the nave, looking towards the altar, showing the ceiling faced with open timber slats, rising in the centre to the peak of the roof. The ceiling is the principal source of light, natural and artificial.
13, looking into the baptistery, through the screen at the west end.
14, one of the side chapels on the north side of the nave.
15, baptistery and font. The sculptor of the crucifix is Peter Watts.

14

15



RECONSTRUCTED PARISH CHURCH, TOLWORTH

ARCHITECT | **KENNETH WOOD**

16, the new entrance end of the church, faced with mahogany boarding below and an open cedar screen above.

16

The conversion of an existing dual-purpose church-hall for purposes of worship only, and the addition of a new hall and ancillary accommodation. The site was restricted, necessitating the placing of the hall alongside the church close to the edge of the site, and the required extra accommodation could only be given in the church by reversing its orientation and adding a new chancel, sanctuary and vestries to the end. There were also difficulties of light, which determined the unusual shape of the hall and its structural system, as well as the glass screen which, 30ft. long and 13ft. high, occupies the whole south side of the sanctuary. The light coming through the screen is diffused by white terylene curtains.

The existing bell-turret at the east (now the entrance) end of the church has been removed and the end brought forward to cover the new vestibule, a new facade being created in the form of a laminated timber arch, beneath which the bell has been rehung. The tiling

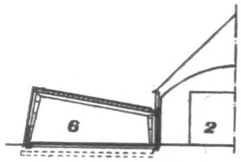
17

17, the same end of the church as that shown above, before reconstruction.

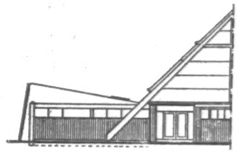
of the roof, however, has not been extended, the new part of the roof being left with open timbers to admit light to the baptistery between the entrances. Similarly, the new gable end is filled by an open timber screen of cedar. The need for structural bracing has been used to provide a large cross in the gable.

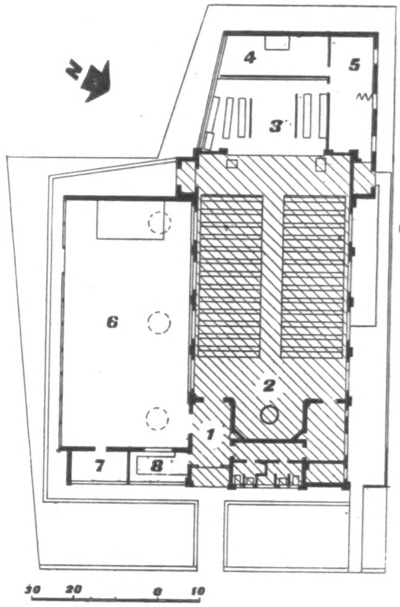
The new chancel, etc., is of timber frame construction with brick cavity walls. The hall is similar, with the main timber frame of Gurjun. The hall and the sanctuary screens and external boarding are mahogany. The new arch at the extended end of the church is of laminated Douglas fir, and the cross of Gurjun.

Emmanuel Church is a Church of England evangelical low church, demanding the greatest simplicity in the furnishing. New furniture was designed by the architect and consists of Lord's Table with black enamelled steel framework, brass trim and beech rail and top, stalls and lectern of Douglas fir on black steel framing, hymn and psalm boards of Doussie and white beech and pulpit of Douglas fir for the framework and Doussie for legs, base and handrail.



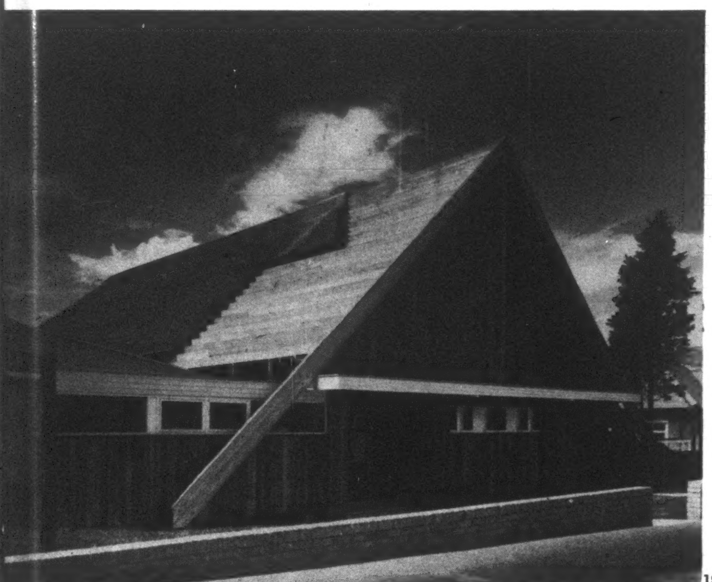
section through hall and church


east elevation



key
1, entrance.
2, existing church.
3, chancel.
4, sanctuary.
5, vestry.
6, new hall.
7, store.
8, kitchen.

The shaded portion represents the area covered by the original building.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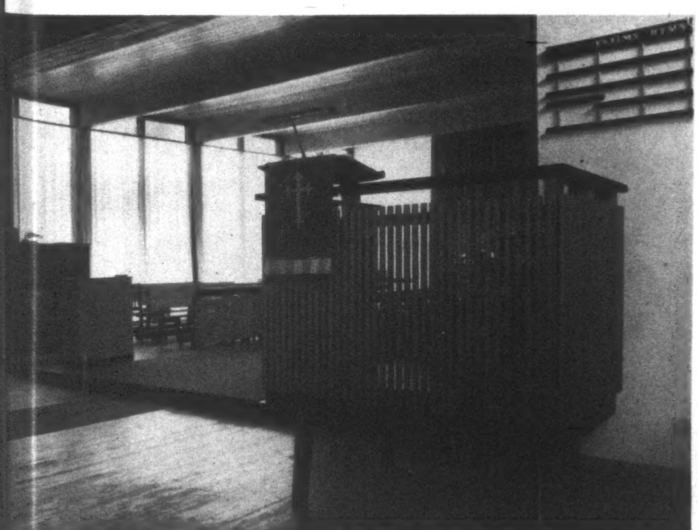
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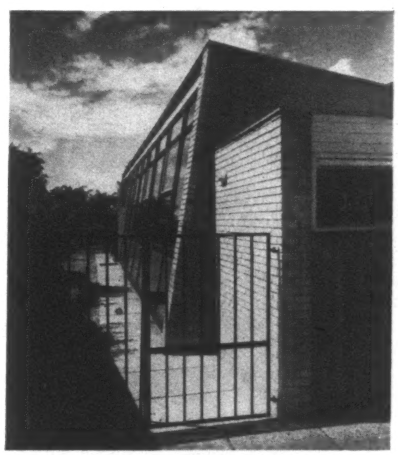
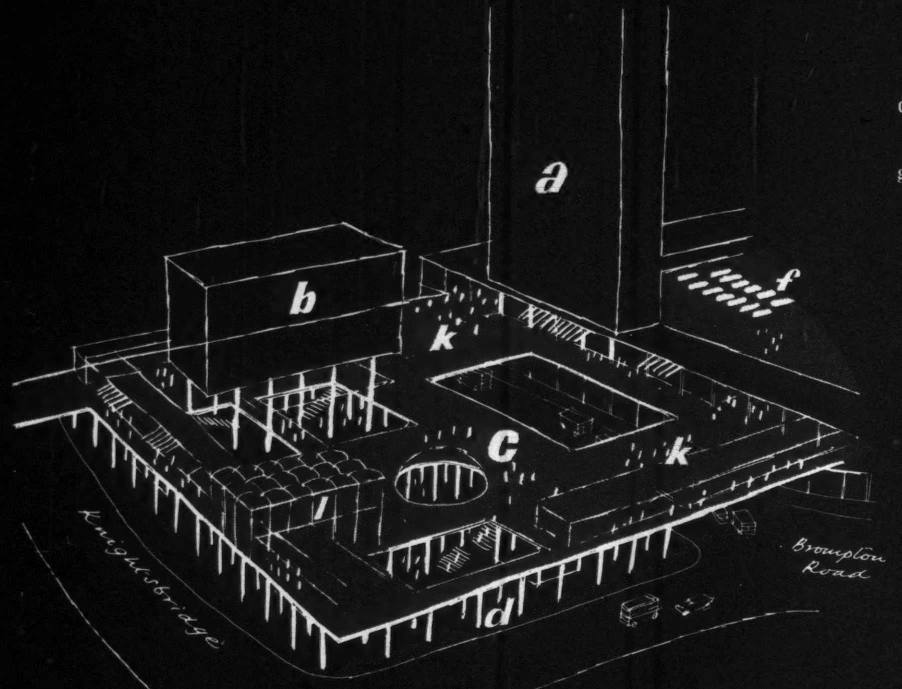

20

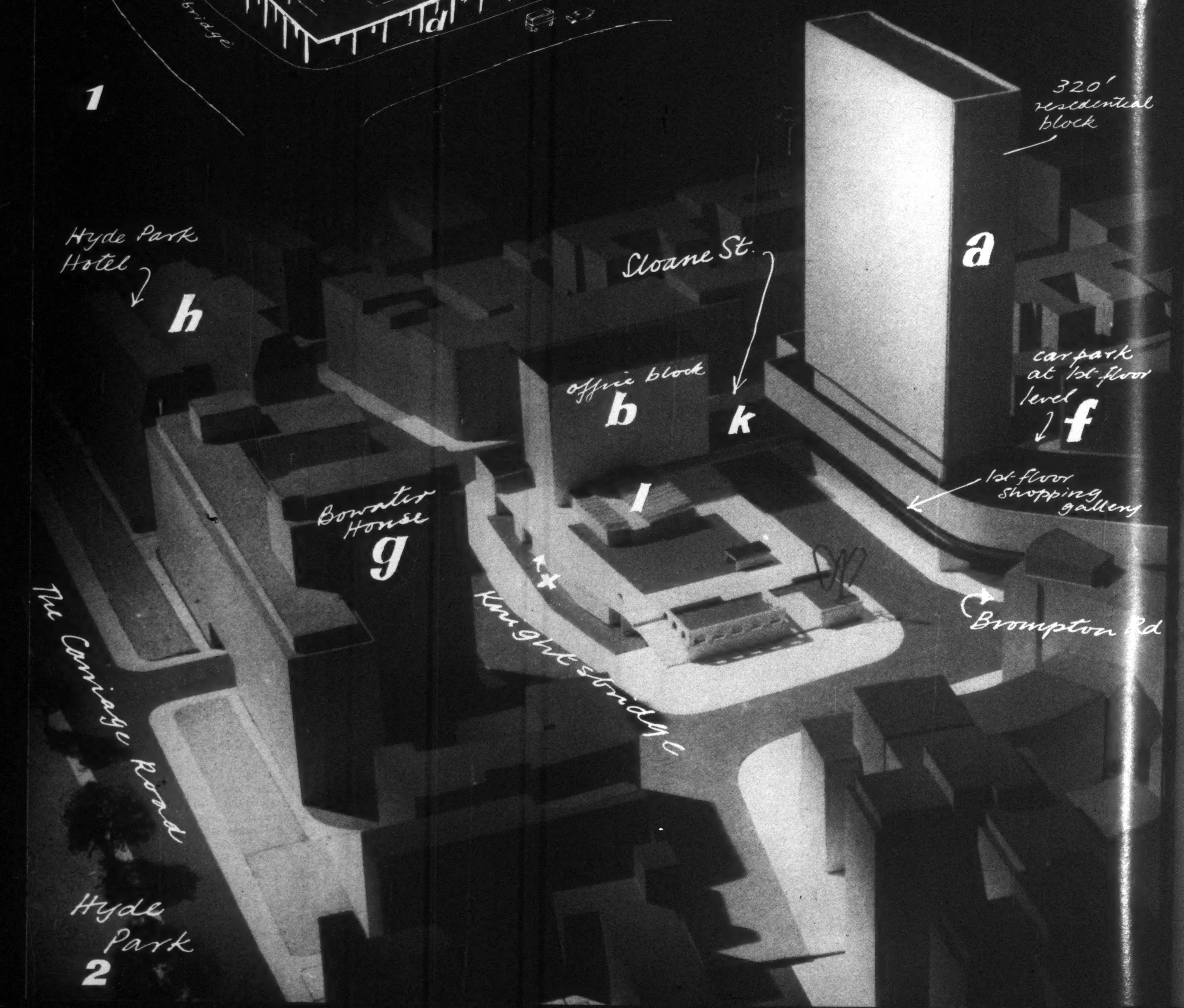

21

18, the extended end of the roof showing exposed timbers and gable filled by open cedar screen.
19, interior showing pulpit, which has a frame of Douglas fir, legs, base and handrail of Doussie and front formed of vertical rods of Douglas fir.
20, the window wall of the hall along the edge of the site. The end wall is in brick.
21, inside the hall, constructed with a timber frame and box beams in Gurjun.

The LCC scheme for Knightsbridge, shown in diagrammatic form below, **2,** with its 320 ft. high residential block, **a,** has been opposed on the grounds that high buildings should not be permitted so close to Hyde Park. A solid wall of high building right on the edge would indeed be fatal but towers set back and seen above the trees could, with skilful attention to silhouette and grouping, look very fine. However, in this scheme, it is the design of the central traffic island that is all important and in the following pages the proposal is put forward for a first-floor deck, **c,** left, raised on columns to unify the two sides of the square, as shown in **1.**



1



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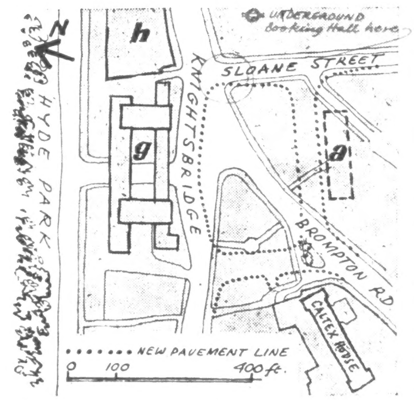


Plan showing area affected.

key to illustrations
a, tower block, flats
b, office block
c, pedestrian deck
d, ground level paving
e, Underground booking hall
f, roof car park
g, Bowater House
h, Hyde Park Hotel
k, bridge
l, restaurant
x, podium

TOWNSCAPE

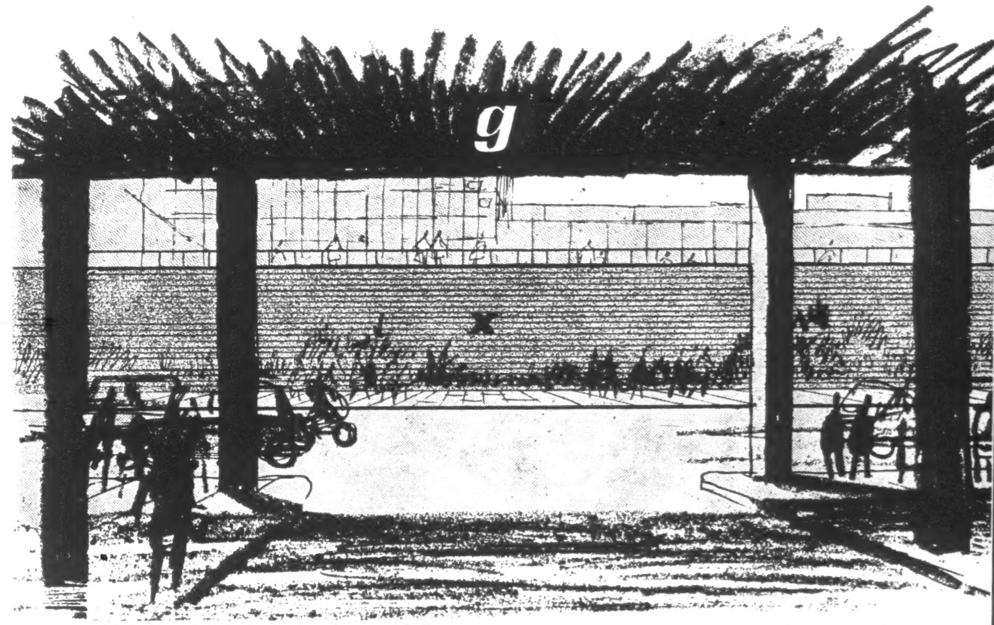
Kenneth Browne

KNIGHTSBRIDGE GREEN

In their desperate attempt to ease the worst points of congestion, the traffic authorities intend to follow up the Hyde Park Corner scheme, now under construction, with a giant 400 ft. roundabout at the junction of Knightsbridge, Sloane Street and Brompton Road, the next bottleneck to the west. The demolition required to make room for it can be judged from the map above. In the absence of a realistic plan for London's traffic, this roundabout is unlikely to prove more than a local remedy. However, since its position, shape and size have been decided, the important thing now is to ensure that it is not just another large area of wasted space ringed by traffic.

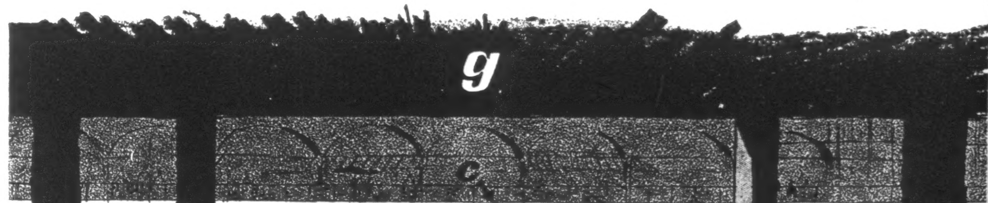
The LCC planners have appreciated the problem and, aided by a co-operative landowner, propose to treat this as a comprehensive development area so that a co-ordinated scheme can be evolved. The block model (**2** facing page) is a statement of their general intentions, and shows that they propose to build on the roundabout a large pedestrian terrace or deck on a podium, beneath which is a ground level car park. On the terrace stand an office block ***b*** and restaurant ***l*** reached directly by escalator from Knightsbridge Underground station. A footbridge ***k*** connects across the road to a first-floor shopping gallery under the residential tower block ***a***. At the rear is a roof-level car park ***f*** reached by ramp from a side street.

This seems the right kind of approach to the problem and the idea of a large pedestrian deck well above traffic level is an admirable one. The alternative put forward here is merely a development of this idea, based on a suspicion that from the street approaches (sketch ***3*** on right) the



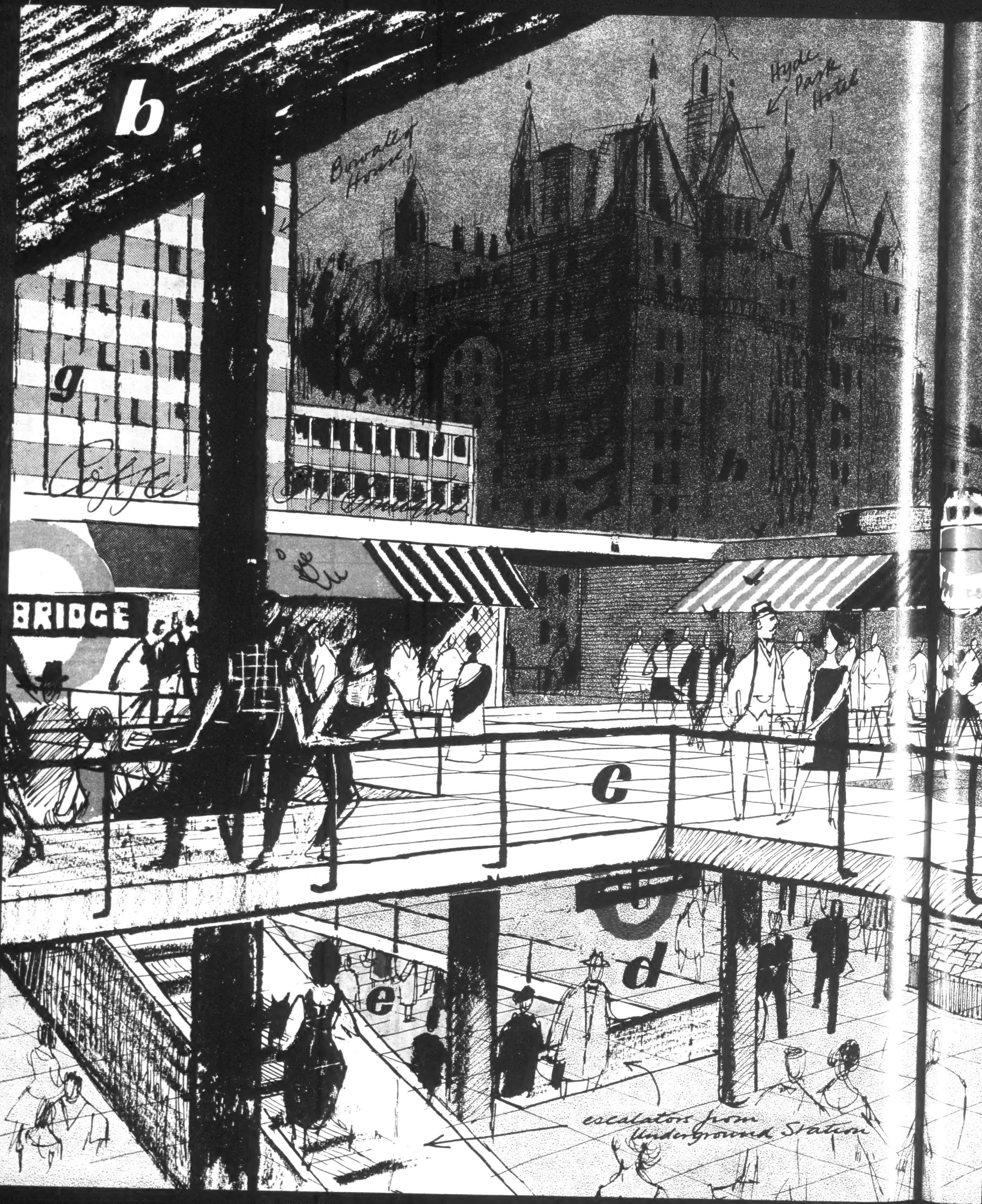
3 *Approaching from Hyde Park the view under Bowater House* ***g*** *is stopped short by the solid podium shown in* **2** *. . .*

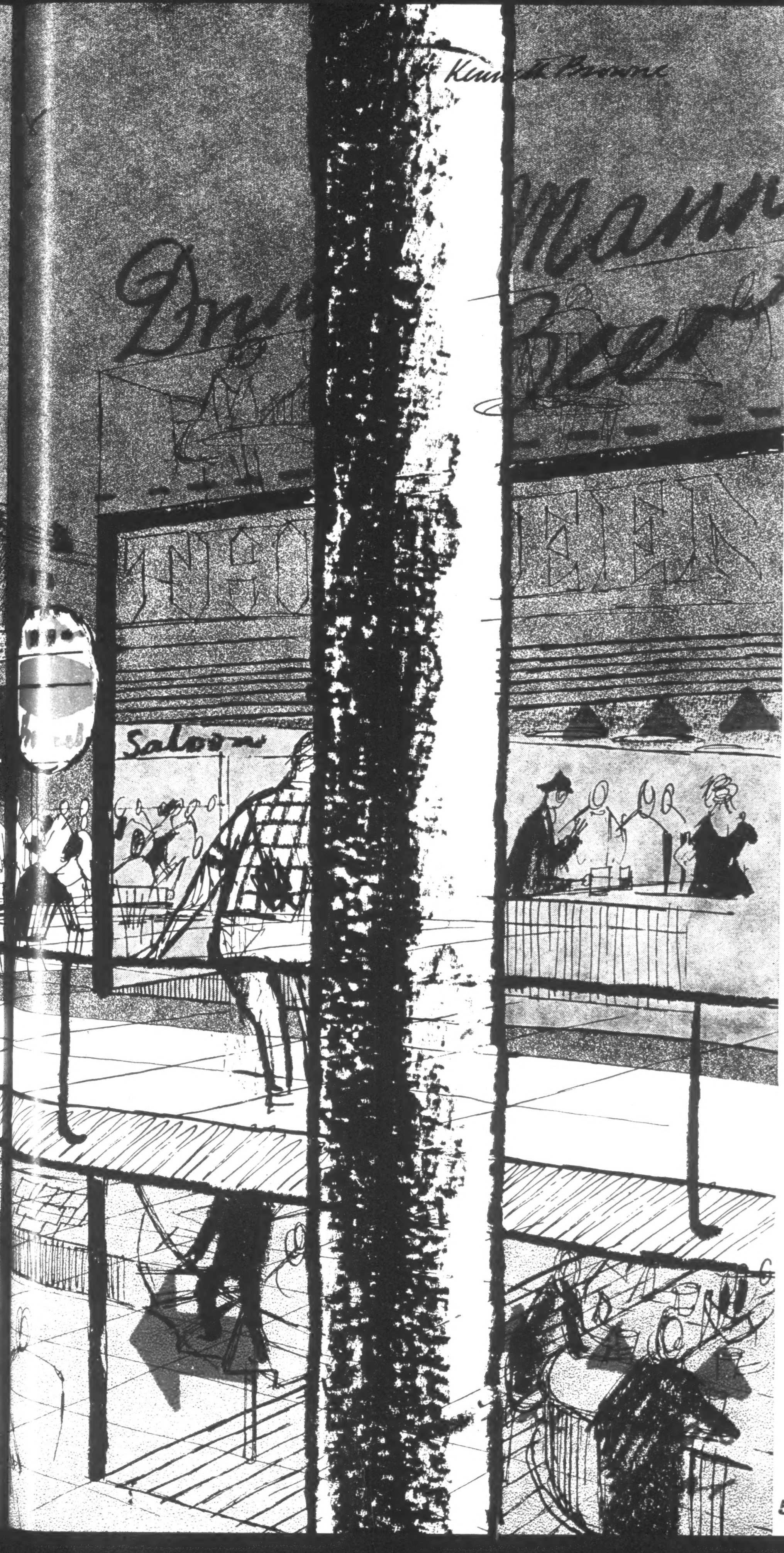
solidity



4 *. . . but if the terrace* ***c*** *is raised on columns as in* ***1*** *the eye can penetrate to the kaleidoscope of traffic and shops beyond. Some physical barrier (e.g. railings) would be necessary.*

transparency


b
Hyde Park Hotel
Bowater House
g
Coffee
h
BRIDGE
c
d
e
escalator from Underground Station



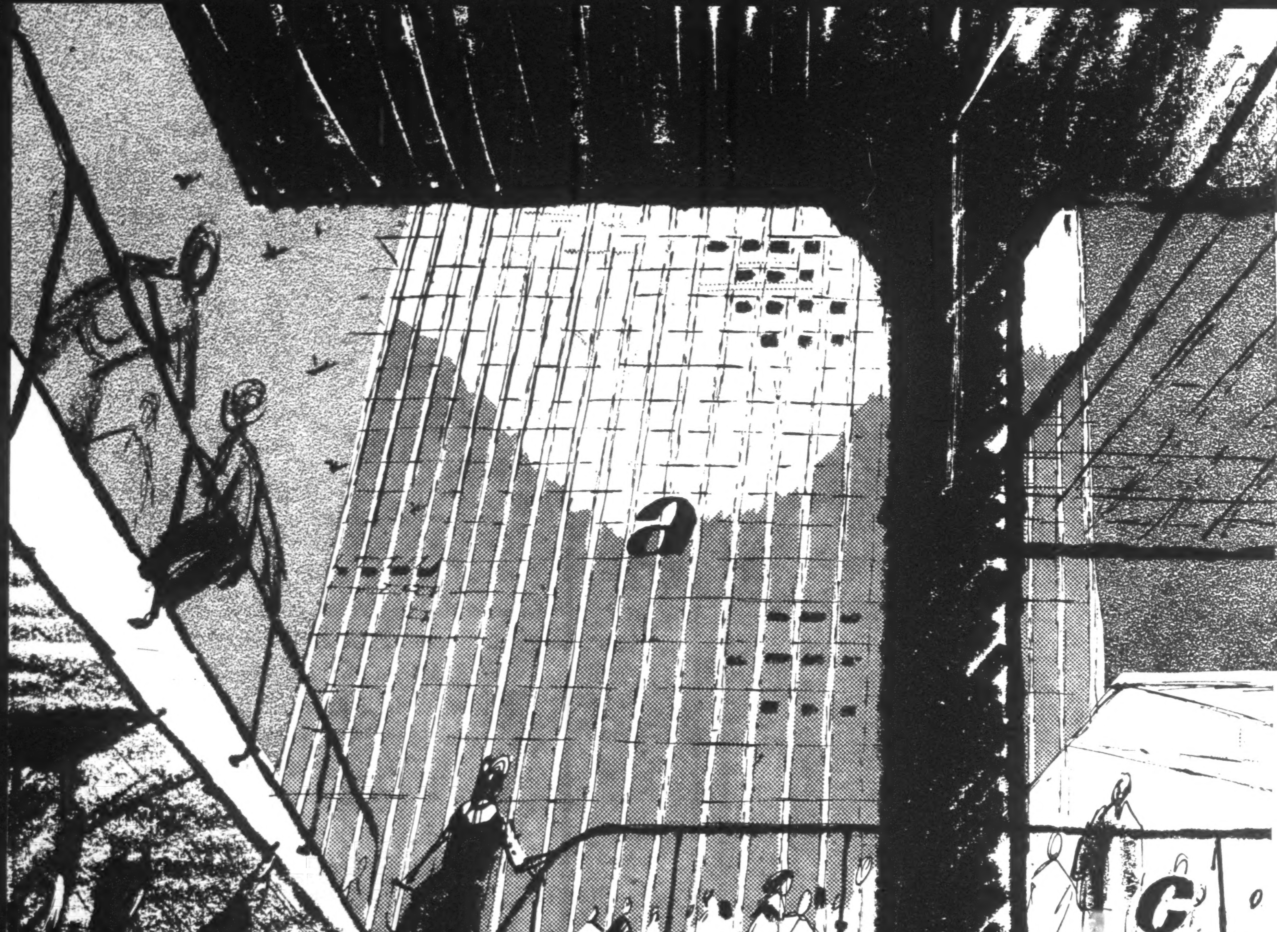
5

*Typical view from the pedestrian deck suggested in **1**, looking under a building **b** raised on pilotis. The deck is pierced so that activity can be seen on three levels at once. Escalators from the Underground booking hall **e** lead up to ground level and up again to deck **c**. Beyond the perimeter shops are Bowater House **g** and the Hyde Park Hotel **h**.*

podium itself ***x*** might appear too massive and visually divorce one side of the new square from the other. If the pedestrian deck were raised on columns ***1*** (page 332) the effect would be light and transparent and the opposite sides of the square would be linked ***4***. To make this idea of a first-floor pedestrian deck really work it should, perhaps, be carried further. In plan it should be increased to the full area of the roundabout below, and be thought of as a continuous floating slab spanning across the street to the south and continuing under the tower block ***a*** to link up with the car park ***f***. It should be pierced to admit light to the roadway and the ground-floor level of the island itself, and would now be large enough to accommodate a variety of activities. In piercing the slab interesting multilevel views could be achieved, ***5***, and a new and exciting focal point provided for Knightsbridge. The raised pedestrian deck would be fed directly from the tube station ***e*** and contain small shops, kiosks, clubs, a pub and coffee bars, their intimate scale contrasting with the backcloth of high buildings across the street, such as Bowater House ***g*** and the Hyde Park Hotel ***h***. This differs from the LCC scheme in looking inwards as well as outwards. A small theatre might replace the office block ***b***. A ground-level service road would be required for the shops, and a certain amount of car parking space, but in the main this would be concentrated at ***f*** (see the first diagram, page 332).

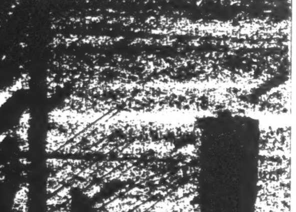
Climbing from ground level ***d*** to the pedestrian deck ***c*** would now be an exciting visual experience ***6***, the cut-away slab above suddenly revealing the 320-foot residential block ***a*** towering upwards.

The LCC scheme has been criticized by

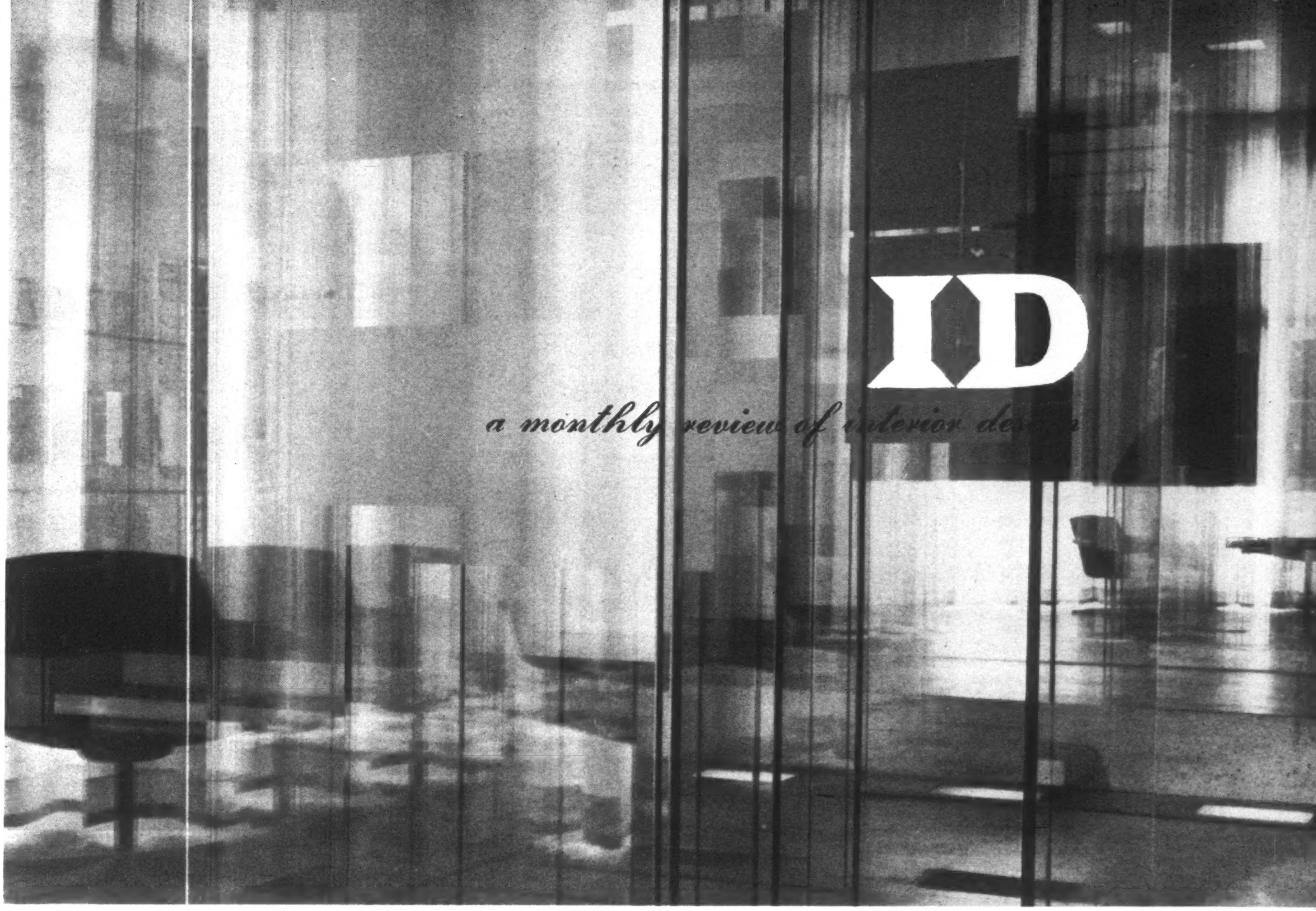


View from ground level **d** *looking up to the pedestrian deck* **c** *with the tower block* **a** *soaring up beyond.* **6**

local residents for building on the traffic island. What is not generally realized is that no development would take place at all unless the owner could be certain of getting as much accommodation on the site as there is at present. So in fact the probable alternative to the LCC scheme, which piles up most of its accommodation vertically but does not increase the overall accommodation, is not an open, tree-planted square as many would wish but a development of this kind of which we have seen too many already.



ID
a monthly review of interior design



1

Glass Showroom in St. James's, London

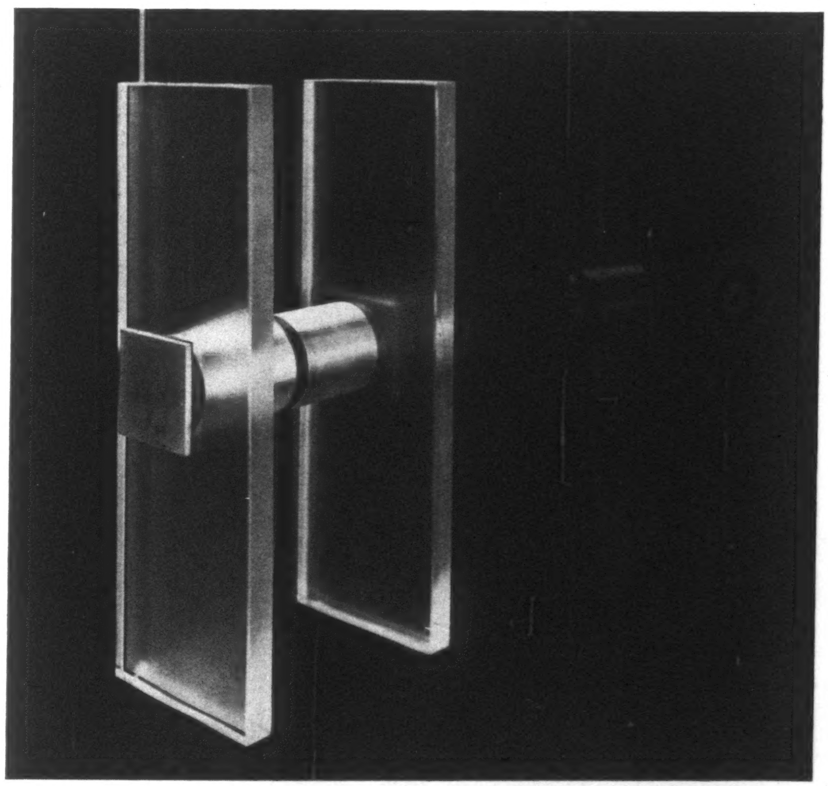
architect *Margaret Casson*

assistant *Bernard Holdaway*

A large upstairs room with a wide bay-window overlooking Green Park was required to be converted into a display of glass—glass pure and simple, in all the forms manufactured by the client (Pilkington Bros.) and in its natural form.

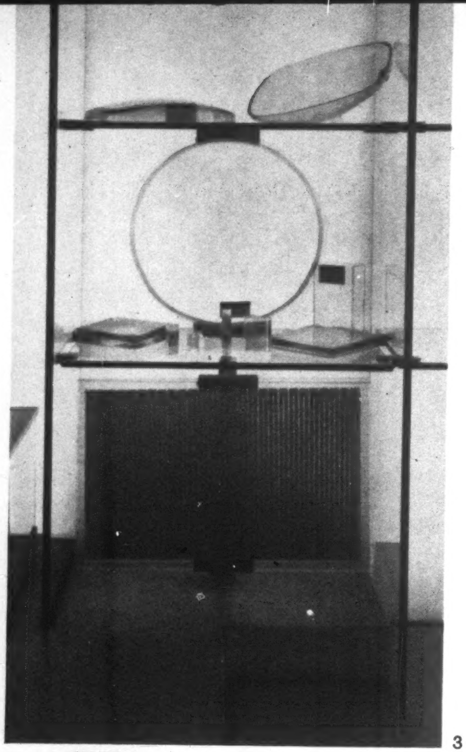
1, occupying the centre of the floor, half-way between the bay window and the mirror-clad back wall (which carries the reflections at the extreme right) is a maze-like composition of narrow sheets of polished plate glass running from floor to ceiling (see 5, over page). Transparent when viewed against the light, it makes an elaborate play of repetitive reflections when seen from the window side.

2, toughened glass door-pushes on one of the plate glass doors to the showroom, reflected in the black glass wall of the access-corridor.



2

glass showroom
in St. James's



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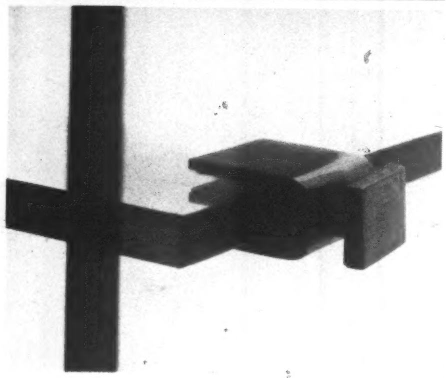

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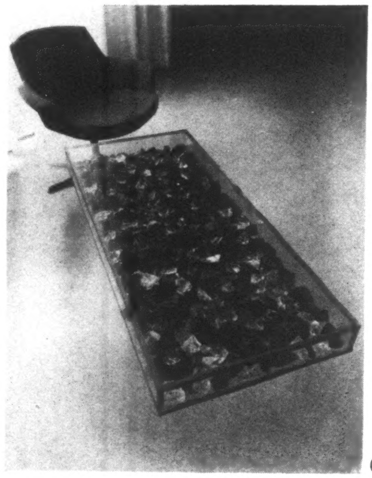
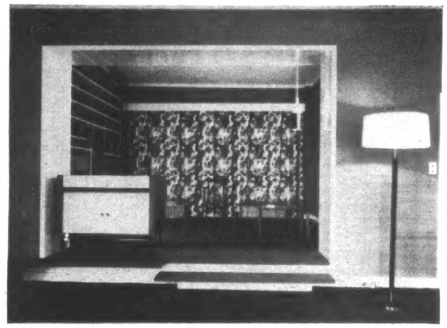


6

3, one bay of the glass shelving that runs down both sides of the room, to carry products for display. Underneath is an electric space-heater consisting of a flat metal heating-element sandwiched between two sheets of glass.
4, one of the metal clips securing a shelf to an upright panel—these clips are the only parts of the shelving that are not made of glass.

5

5, general view of the room from the entrance (which is on the raised dais whose edge and step are seen in 3). The glass panels of the central display are carried in slots in the ceiling and terrazzo floor, and are illuminated by lights sunk in the floor and ceiling. Other lighting comes from fluorescent fittings behind the shelving, diffused through a layer of glass fibre tissues. The windows are also curtained in heavy glass fibre fabric.
6, the only strong colour accent in the room—a low table with a top made entirely of plate glass, filled with large chippings of antique and optical glass in characteristic ambers, blues, and reds.



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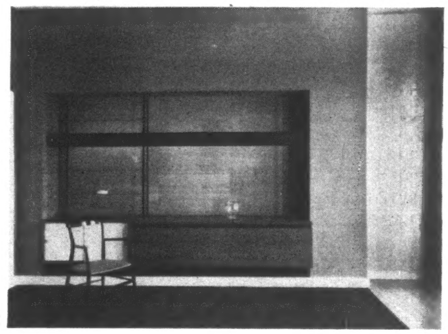

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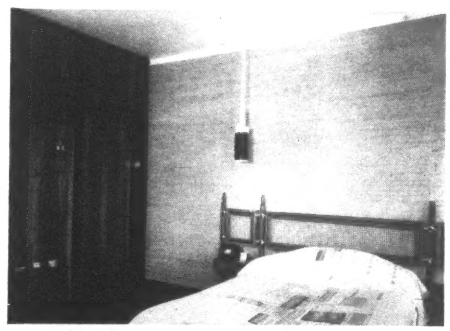
7, 8, two views of the living room, which occupies the whole of the first floor of the flat in Eaton Square (see opposite)—7 shows the study area up two slate steps from the main room, which lies across the front of the house, 8 (at right angles to 7) shows the built-in hi-fi installation and the gold mosaic wall flanking the window. The carpet is dark green and the walls are covered in grey-blue silk paper.
9, the bedroom, with entrance and wardrobe wall on left.
10, the bathroom—cupboards, etc., in the corners reduce the room to a cruciform plan which is 'doubled' by the mirror, seen here, and another mirror facing it over the bath; the doors at the left give access to the bedroom wardrobe from the back.



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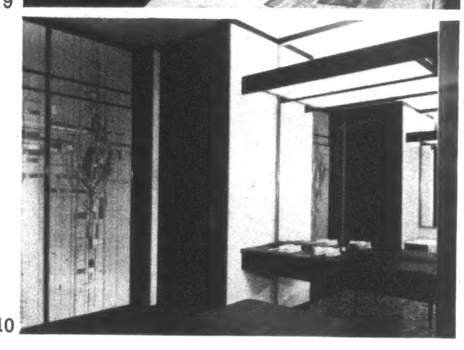

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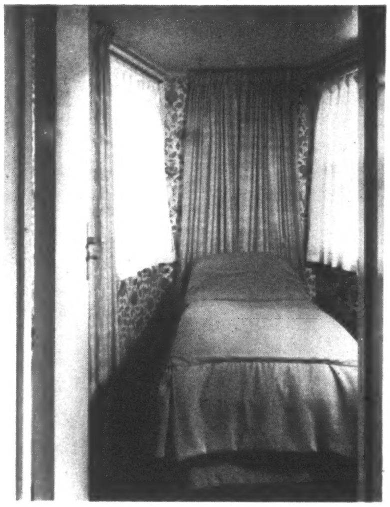

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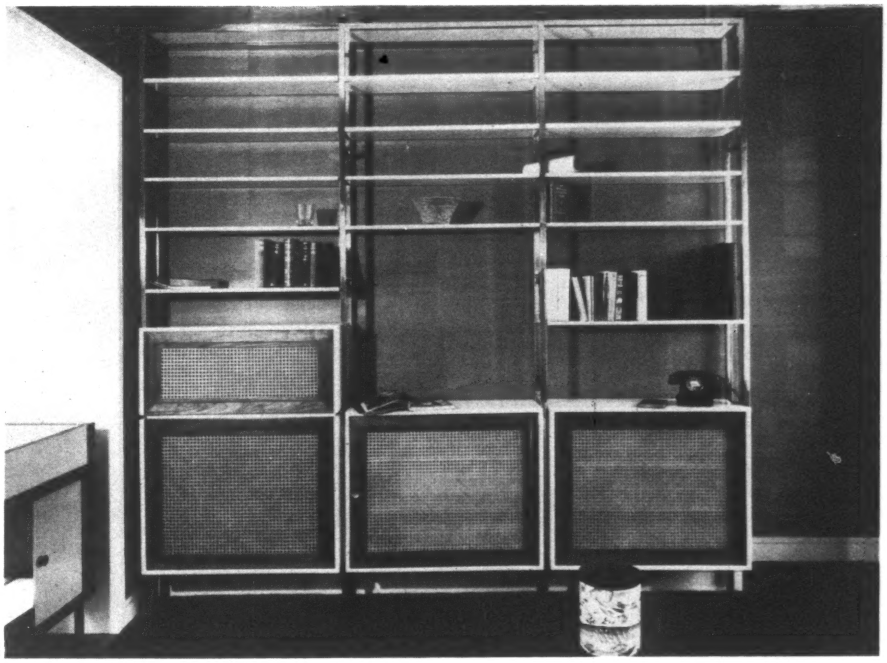
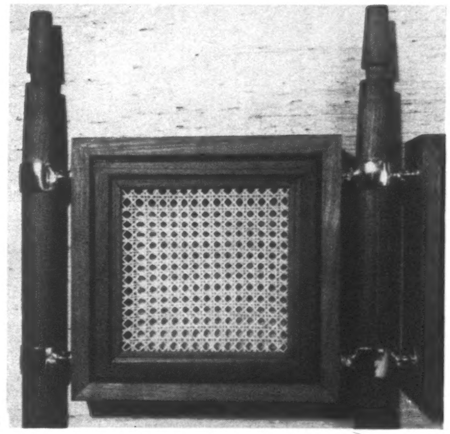


12

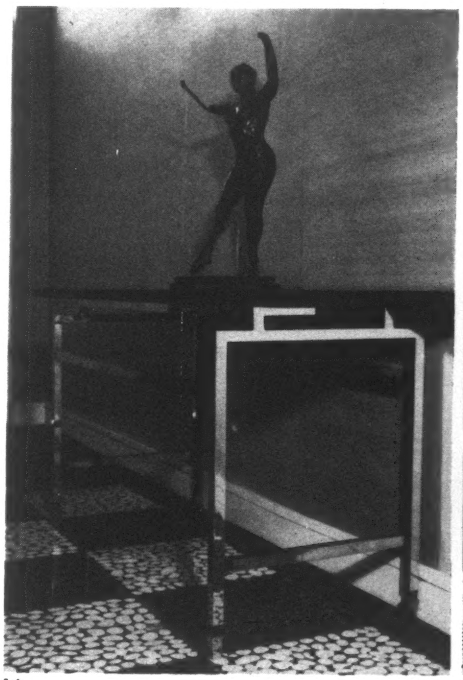
Flat in Eaton Square, London

architect *Margaret Casson*
assistant *Heather Blake-Smith*



13

11. the small back bedroom which, like the master-bedroom, is at ground level.
12. the book-shelf unit in the study area (see 7, opposite), the frame of square, brass-finished tubes with white-painted woodwork, teak trim and caned fronts to the cupboards. The drink cabinet, left, has sliding tambour shutters and internal lighting with a shutter-actuated switch.
13. detail of French caning and teak frame, with brass brackets, which form the standard constructional devices of all the purpose-made movable furniture in the bedroom.
14. Degas sculpture on the hall table, which has a top of green serpentine marble, carried on a square, brassed frame. The hall floor is of black and white marble-pebble tiles, and walls are covered with orange silk-paper.
15. corner mirror in bedroom with long stool in foreground, and wardrobe doors at right. The inlay of brass and coloured plastics in the rosewood doors is by Mitchell and Hollaway.



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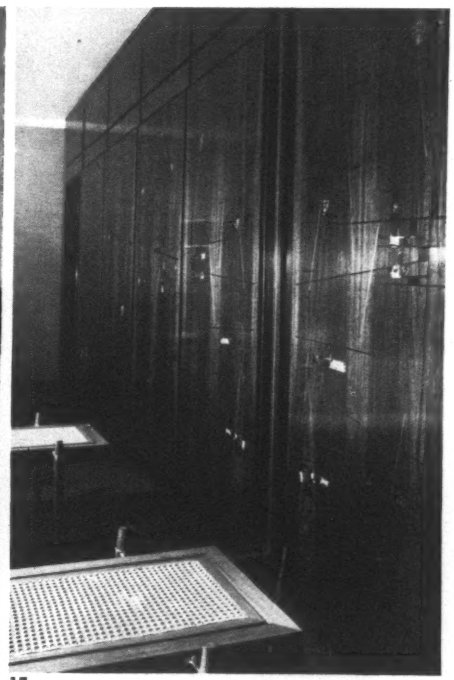

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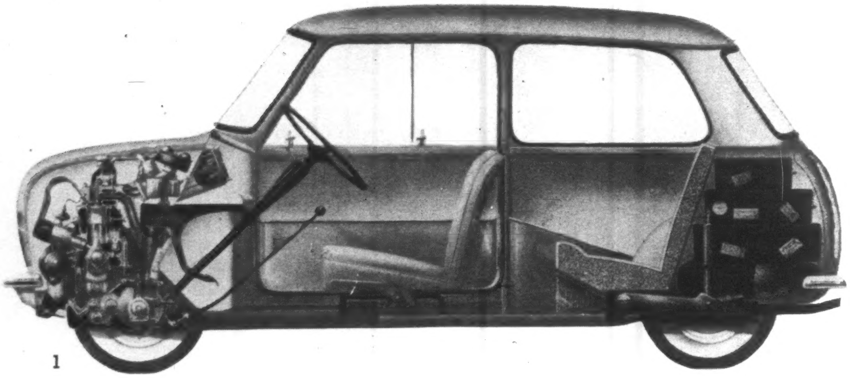

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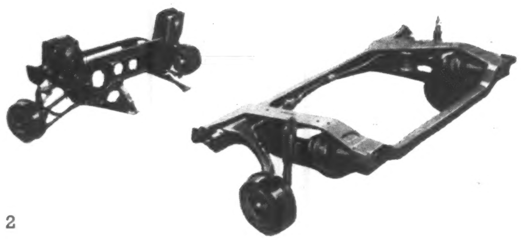
DR

design review



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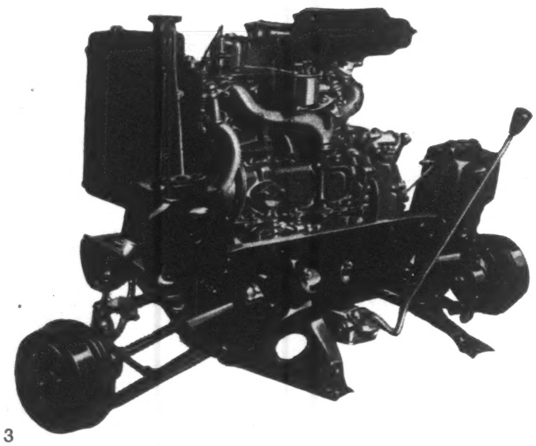


3

4

BMC miniature cars

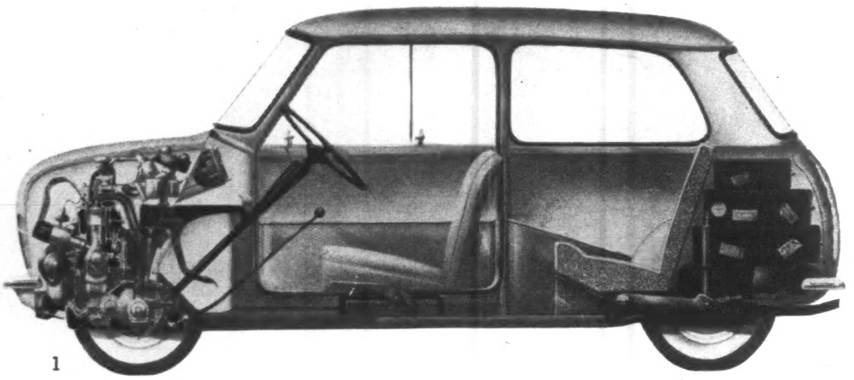
Answering closely to the functionalist dream of a motorized box on casters, the new, almost identical, front-wheel-drive Austin Seven and Morris Miniminor have been justly acclaimed as a radical departure in British car design.

1, *the section shows how the use of very small wheels, dismissed to extreme corners of the body shell, has made it possible to create a large passenger-space in a short car—it is to be hoped that other manufacturers will follow the lead established here by the designer, Alec Issigonis, and regard seating-dimensions as something that should answer an irreducible optimum, not an absolute minimum.*

2, *the running-gear consists of two axle-aggregates fixed to the underside of the structural shell, an unusually clear separation of parts in automotive practice, where running-gear tends to be distributed all over the car, and mixed up with its structure.*

3, *the power unit fits on top of the front axle aggregate, in the transverse position that has appealed to designers of front-drive cars all through the history of motoring, as in the German DKW models. The resultant unit, with all controls attached except the pedals (and their integration into the unit may be only a matter of time), could presumably be fitted to any suitable wheeled body as a kind of land-going outboard motor.*

4, *in terms of styling, the bodywork of these 850 cc. cars is very frank about their internal arrangements and functions—except that there is no outward sign of the side-mounted radiator, which delivers its hot air into the near-side wheel arch. On the other hand, the management of external details and trim appears—as is so often the case with British cars—untidy and unconsidered: the raised "seam" that runs from the windscreen pillar to the front wheel arch appears to be simulating a large door, while that at the back, following the profile of the rounded rear quarter, breaks up what would otherwise be a compact form. The filler-cap and rear lights look as if they had been stuck on to the body as afterthoughts, rather than designed into it from the beginning.*



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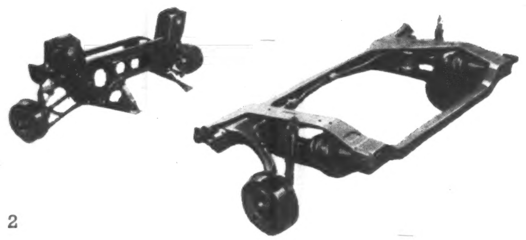

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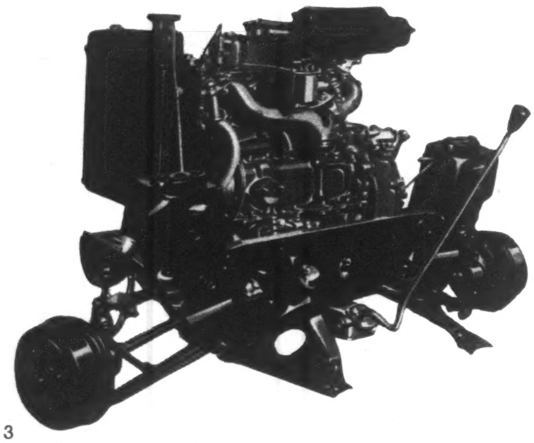

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NEOLIBERTY: THE DEBATE

Reyner Banham's article Neoliberty, The Italian Retreat from Modern Architecture, *published in the April number of the* REVIEW, *aroused, in Gillo Dorfles' words, 'immenso scalpore a Milano' although, in fact, the great uproar extended to other places inside Italy, and outside it as well. This resulted in a great deal of correspondence and editorial comment, of which the most combative or informative parts are reprinted below, with Dr. Banham's comments. First, however, a general misconception about the status of the article needs to be cleared up: many of the replies assume, explicitly or implicitly, that the first article in the* ARCHITECTURAL REVIEW *is on every occasion an editorial. It is only such when unsigned, or when it appears over the signature 'The Editors,' but if it appears over the signature of a particular person, then it represents only that person's individual point of view. Obviously, the Editors are unlikely to publish opinions directly hostile to the established policy of the* REVIEW, *nor do they normally publish texts that they do not believe to make a worthwhile contribution to a discussion of the subject concerned, but it is not to be assumed that they support, in detail, every proposition in any article made over a personal signature.*

Federico Correa

Dr. Banham's opinions, and the polemical tone in which they were expressed, were his own. They evoked responses that were equally personal, and equally polemical—thus, Federico Correa wrote from Barcelona:—

Can a serious architectural magazine, as I thought yours was, publish something (like) your article on Neoliberty? What's all this talk about Neoliberty anyway. . . . Form follows Function, the modern movement said, referring of course to valid function . . . form will change through functions that are new, or old but valid and newly reconsidered. These last, necessarily left behind when crossing the famous watershed, will be responsible for a similitude with past forms.

Nobody is trying to go back, in romantic revival, to good old 'borghese' days. But Liberty lessons in wearing and growing old nobly, ingenious use of simple economic materials in simple economic structures, and so on, had to fall upon the eyes that contemplate the ruining in five years of those beautiful clean-cut facades with sweeping reinforced concrete cantilevers faced in vitreous ceramic. These same architectural eyes will continue to consider architecture of the Art Nouveau period as the first of the modern, whether or not purely plastic-minded eyes consider Art Nouveau as the last of the old styles.

Importing that the intentions are just those of looking back, reviving the forms of a middle-class past, is lack of either insight or goodwill.

* * *

Reyner Banham comments: (*a*) the argument on weathering is one that has been used *ad nauseam* by the enemies (and some of the professed friends) of progressive design. To take purely Italian examples for argument's sake, the present condition of Terragni's work, faced in a variety of materials, makes nonsense of it, as does the parlous condition, a few years ago, of Moretti's Fencing School in Rome, faced in that 'reliable' traditional material, marble.

(*b*) it is not I that imputed a revival of the forms of a middle-class past, but Aldo Rossi, a professed friend of Neoliberty, and the same point was made, by implication, by Paolo Portoghesi. Where I appear to lack 'insight and goodwill' seems to be in considering such a revival to be a bad thing.

Sybil Moholy-Nagy

Mrs. Sybil Moholy-Nagy wrote in even stronger terms from New York:

Reyner Banham's article *Neoliberty* suffers from that oldest of British afflictions—condescension. If

anything this is an attitude typical of the 'borghese' middle-class through its ignorance of any contexts larger than the British viewpoint. The invective of 'infantile regression' with which the critique ends seems much more applicable to a man who indulged in a sort of hero worship . . . only to flip over into 'confusion followed hard on disillusion' when he fails to understand the direction in which his hero is maturing. (Remember Ruskin and the mature Turner) 'Queasiest and most cowardly,' 'wrong-headed and misguided' just aren't terms of architectural analysis where a whole movement is under scrutiny. . . .

What matters is that Mr. Banham has not the slightest inkling of the ideological basis of the Italian architectural revolution. This basis is a profound obligation toward Historical Continuity which is as embedded in the Italian mind as is a parochial insularity in the English. The whole history of Italian architecture is one of transitions and not of clashes, a supreme power to fuse thesis and antithesis—developed elsewhere—into a creative synthesis . . . it is a rhythm that goes from La Zisa to Assisi, from the castle at Volterra to the Villa Madama, and from the Piazza San Marco to Sant'Elia's many-storeyed city centre.

That a group of internationally recognized architects were willing to risk their standing with the CIAM fraternity . . . is one of the miracles of our undevout age; and it might be flattering but not true in fact that they are all young men. The justification of their revolution has been stated by Mr. Banham himself: that an architectural movement should be supported by the ideals and methods of its day. This contemporaneous obligation has forced on thinking architects, not only in Italy, the conclusion that we must 'start all over again' because the purely subtractive results of the identification of architecture and machine-cult has revealed itself as a romantic pipe-dream . . . is Mr. Banham that young not to remember the gangling stage of functionalism? . . .

It makes one squirm with embarrassment to hear the ARCHITECTURAL REVIEW plead tearfully for the preservation of Le Corbusier's masterpieces which are in a state of shameful disintegration because the architect was either too unskilled or too arrogant to bow to *time* and *impact* as the ultimate judges of his design. These responsibilities have been resumed by the Italian architects, together with an identity of enclosing form and enclosed space totally absent from 'out-and-out modern'. . . .

* * *

Reyner Banham: I feel quite undismantled by Mrs. Moholy's hatchet-job, since most of her energetic swings have missed the points of fact involved, viz. (*a*) Sant'Elia, the crucial figure in the twisted history of Italian modernism, is not a figure of synthesis, but of violent antithesis to the Italian tradition of compromise with the past. Has Mrs. Moholy actually read his *Messaggio*, with its contempt for piazzas and flights of steps, its hatred of the past and its traditions?

(*b*) Ernesto Rogers, the patron of Italian defeatism, is one of the last few people still trying to resurrect the corpse of CIAM. It is precisely the CIAM group of Italian architects, with their peculiar views on history, who have made Neoliberty possible, and their continued acceptance by the 'CIAM fraternity' finally disgusted the younger members of CIAM to the point of revolt.

(*c*) But of course I am too young to remember the gangling stage of functionalism, and so is everyone else under forty. I write of Functionalism as history, not as something practised by my personal friends and enemies. My disappointments with it are therefore different to Mrs. Moholy's, and that goes for the rest of my generation.

(*d*) And speaking of generations, I spoke also for my generation, not for myself, when I wrote of an ideal picture of Italy and subsequent disappointment with it. Italy has never been my hero, as Mrs. Moholy could find by looking back over earlier issues of the AR, and I, *personally*, am neither surprised nor suddenly disappointed at what has happened.

Figini and Pollini

From Italy itself came one letter from architects directly accused of 'retreating' in Dr. Banham's article, Luigi Figini and Gino Pollini, saying that they agreed in part with the argument of the article, but not where it held the whole Italian Modern Movement to blame, recalling that they themselves had attacked Neoliberty for its superficiality, proposing that—besides the 'style of the Retreat'—there was also what might be called the 'style of revision, or something analogous' and continuing:

We hold to be already acquired (by universal acceptance) the right of an artist to continual research (which could carry him beyond the positions he has already achieved) while we deny that, in homage to the idol of consistency, he has any duty to continue repeating or copying himself. But this does not mean that we share the iconoclastic position of those today who require the turning of a new leaf and a fresh start from the beginning. Nor do we believe the message of rationalism to be completely exhausted.

With the polemical avant-garde period finished, our cultural position today—unlike that of 1920–1940—induces us to make a considered re-appraisal, discriminating what is valid and vital from what has proven fallible. (The pressure of social values, the measure of the human scale as norm of construction, and the 'method' of squaring up to architectural problems, can still bind us to the experiences of rationalism.)

Turning to our own particular case, that is, to our building in the via Circo (1957) which has been presented in the AR as an example of the 'retreat' by comparison with another building of ours built ten years before (via Broletto, Milan, 1947), we wish to draw attention to the following:

The shape of the top eaves-cornice, which chiefly characterizes the building, arises from technical studies aimed at an efficient solution of the problem of defence against bad weather, achieved here by means of large prefabricated concrete tile slabs and joint-covers.

So, too, a predominantly technical reason accounts for the use of projecting blocks of solid porphyry, which serve better to secure the cladding panels of common porphyry paving-setts to the wall behind (an idea already used by us in a project of 1938).

Thus here, as in other parts of the structure, a greater degree of formal definition has been attained through technical research.

In this building too, full weight has been given to existing surroundings—an old urban nucleus of the city. This determined us not to allow the voids to prevail too much over the solids (thus limiting the use of large glazed areas) and to use materials and colours that more or less imitate those of surrounding structures.

* * *

Banham: In front of a document such as this, spoken from experience in terms of manifest honesty, I bow my head with respect, only wishing that the rest of the polemics had been of this quality. Nevertheless, the soft-option approach of the last paragraph will strike any English reader, and make him ask why the Italians, after some fifteen years of accumulating skill in the insertion of unashamedly modern buildings into historical environments, should now apparently lose their nerve, and start to back off into one of the most vicious of compromises (and one from which we have suffered so long in England)—'Keeping in Keeping.'

Ernesto Rogers—Casabella

The most energetic reply from an architect implicated by name as one of the 'retreaters' came from Ernesto Rogers, who devoted the whole of the first essay in *Casabella-Continuità* 228, to a personal apologia and rebuttal, considerably longer than Dr. Banham's original attack. Dr. Rogers was amongst those who believed the original article to be an editorial, and therefore devotes much of the early part of his text to general reflections on the ARCHITECTURAL REVIEW—not very flattering reflections—that are irrelevant to the main argument. However, his general reflections upon the REVIEW and its interior decoration (which he may care to revise now that our new offices have been illustrated) provoked him to the following comment:

Mr. Banham imagines that he has found (no doubt in the dust-laden drawers of that Victorian furniture) the magic key with which to unlock the floodgates of history and deviate its course towards his private aquarium of morays waiting to suck our blood.

One might say that he would find it much more reasonable to use an old Ford than a horse, because the Ford comes with the Machine Age, whereas the horse, obviously comes before. This comparison may be deduced from the rather conventional outlook of the whole article, which argues that, if there must be imitation, the architects who reflect de Stijl are to be preferred to those who adopt the Liberty manner . . .

However, the most important part of Dr. Rogers' rebuttal comes toward the end of his article, and is best given by quoting *in extenso*, the following paragraphs:

A man who cannot see straight deforms everything he sees: 'modern practised as a style since it could not be practised as a total discipline, as the literally hollow formalism of Terragni's Casa del Fascio at Como clearly demonstrates.' Hasn't Mr. Banham seen the coherence between form and function, and hasn't he heard of Terragni's struggle for his work in order to give (unfortunately deceived) a content and a moral form to Fascism. And why did Pagano, Banfi and Labò die if not because with their artists' discipline they could not help opposing the rules of the dictatorship?

He should have more subtly recognized what has often been observed by writers in this country, namely, the continual dramatic struggle of culture in general, with the contingencies of Italian society

(before, during and after Fascism); from this he should have inferred the difficulty of art itself to fit into life, the dialectical relationship, the tenacious duel of love, the incomprehension, the rejections and the redemption of this struggle. Then he might have sensed one of the most interesting aspects of our history, that by means of which Italian architecture, in its valid examples, is a moral act, and, at least implicitly, an instrument of political struggle: its successes are irregular, like the whole history of progressive tendencies in Italy, but for all that it is hardly to be despised and condemned.

After the war of liberation and the great period of partisan warfare, it seemed as if the world, Europe and Italy were rising to a definitely better life and we cherished these hopes, imagining that they were the truth, while afterwards we could not fail to perceive that they were only new Utopias. Since then the whole of progressive and enlightened Italian society has struggled to avoid the shoals of officialdom. And the fact that there sometimes appears to be an architecture which is more charged with feeling than with reason is not due to the retreat of architects—not on your life—but rather to a struggle upstream. One should see what happens in municipal offices, in the offices of the ministries, and how often those few who believe in art have to grit their teeth in order to move beyond the barricades.

It is by no chance that Ridolfi, Gardella, BBPR, Albini, Samonà, Michelucci and Piccinato, among the most ardent defenders of modernity, are no longer doing what they used to and for this very reason are coherent. Hasn't Mr. Banham wondered why? One can hardly believe that these persons and many others have all and at the same time become so irresponsible as to renounce the victories which they have so laboriously achieved. Their strength lies in the very fact that they understood the Modern Movement as a 'continuous Revolution,' that is to say, as a continuous development of the principle of adhering to the changing content of life.

Gradually, the thematic material was enriched and as a consequence the requirements became more subtle; thus, too, the formal results became more difficult, because they tried to include greater and greater numbers of propositions; the enlargement of the range of architectural problems and the immediate result of critical thought, the historical revision of all movements and styles, especially those nearer to us in time, which, owing to the normal opposition arising from the clash of generations had been distorted.

One understood better even (and why not) the Liberty style, in which there were energies still to rescue and canalize.

That the Liberty style should not only be considered in its historical framework, as the ancestor of modernism, but in the light of its own values, is moreover so necessary an observation that as a young student I based a thesis on it for my degree.

What is there to be so frightened about?

There is no doubt that we should look at past experiences (all of them), of course, without allowing ourselves to be seduced by them, as unfortunately happens to someone—and I am the first to admit that.

However slow and elaborate the complex process of review, it has been misunderstood by those less experienced in the field: they have received a shock, but it must be acknowledged that this process may have made even the more experienced overlook a number of cultural components (such as technology) to which they had devoted much more attention at other times. But progress is the result of choice and suspension of judgment, which at any moment may be guilty of incompleteness. Progress is paid for in errors, but I am convinced that the few dangers that Italian architecture risks are quite evident to us, even without the arrogant prodding of Mr. Banham, the caretaker of the Frigidaires, who really believes that 'the domestic revolution . . . began with electric cookers, vacuum cleaners, the telephone, the gramophone and all those other mechanized aids to gracious living that are still invading the home and have permanently altered the nature of domestic life and the meaning of domestic architecture.' We may as well add the mixer, which we can use to mix a cocktail of all the other revolutions, the 'milestones' of which were according to him, the 'Manifesto of Futurism, the European discovery of Frank Lloyd Wright, Adolf Loos's *Ornament and Crime*, Hermann Muthesius's lecture to the Werkbund Congress of 1911, the achievement of fully Cubist painting, and so forth.' All this cocktail needs is a pinch of salt.

* * *

Banham: It would be tempting to make fun of Dr. Rogers—'have to grit their teeth (stringere i denti).' What a terrible thing for grown men who survived the Partisan period! But seriously, the thing that impresses me about Dr. Rogers's apologia is the number of points on which he agrees with me. He and I, as far as I can see, are saying exactly the same thing about Terragni and the Casa del Fascio, but he is sympathetic, and I am not, so that, when he calls up the spirits of the martyrs, I—and many another Anglo-Saxon—merely demand how he dares couple the names of Banfi and Labò, political martyrs of the first rank, with that of Terragni who—if we are to trust the testimony of Giulia Veronesi—did not renounce Fascism till his mind was deranged. However, for a full scale response on purely Italian questions, I would like to refer the reader to Bruno Zevi's comments.

I would, however, like to take Dr. Rogers up on the question of my *key*. I did not discover it in my office, but on that very railway line from Milan to Como. There, working on the problem of Sant'Elia and of Futurism, on the territory in which both were born, I was forcibly struck by the way in which the Italians, more than any other nation except the Americans, have appreciated the possibilities of the small, domesticated and personalized machinery that came in around 1910. Marinetti was the first 'intellectual' to put this appreciation into words, and thus opened the eyes of a generation. Dr. Rogers, like many other Italians, has his view of the historical importance of the *young* Marinetti and *early* Futurism, obstructed by the image of the academic fool that Marinetti became in middle age. In 1910, Marinetti was a figure of world significance in the foundation of twentieth-century sensibility—a sensibility that Dr. Rogers, still urging me to read Ruskin (in a paragraph not quoted above), seems not to share.

Bruno Zevi—l'Architettura

The observations of Bruno Zevi, to which reference is made above, have been numerous and various. In *l'Architettura* 47, 1959, Zevi directly attacked Rogers for citing the 'martyrs' in his own support, and said further:

. . . the Milanese have answered evasively, accusing Reyner Banham of being an 'advocate of refrigerators.' We do not think that one can fight refrigerators with vague generalities.

* * *

Banham: It sounds as if the war between Rome and Milan has broken out again.

* * *

Zevi's main statement on the subject of Neoliberty had been made in the previous issue of *l'Architettura*, under the title *The Andropause of Modern Italian Architects*, and the following is the English summary given in the margin of his editorial:

In the April issue of THE ARCHITECTURAL REVIEW, Reyner Banham has launched a violent attack against the recent trends in Italian architecture—the 'neoliberty,' the 'signorile' and the 'casalingo,' which he considers as many symptoms of 'infantile regression.' We agree, in fact we are grateful to Banham for having credited our magazine with having systematically fought against these forms of decadence, which have occurred particularly in Milan and Turin. There is no question that the Rationalism of the Thirties is in a crisis, but this cannot be helped by turning back to the *Art Nouveau*. If the alternative were between the *Art Nouveau* and the Bauhaus, we would definitely choose the Bauhaus. Every evolution of modern architecture, including the 'organic' one we advocate, starts from the Bauhaus experience. We only have two objections to raise to Banham's article: (1) to publish the works of the masters of the *Art Nouveau*, as we are doing, does not mean to invite people to copy them. . . .; (2) the 'neoliberty' movement is rather limited, a small episode in the story of modern Italian architecture. Banham was right in attacking it, but he should not overemphasize its importance. It is a 'lapsus' more than a disease.

* * *

Banham: I thank Dr. Zevi for support from so distinguished a quarter, but I beg to differ on the last two points. Neoliberty appears to me to be only one symptom of a general disease afflicting Italian architecture—other symptoms can be seen, for instance, in Rome, on the Monte Parioli, but have not been tagged with an 'ism.' As for the publication of works of the masters of *Art Nouveau*—if it is only a matter of revaluation, why is it proceeding in such minute detail, month after month, building by building (five articles already on Mackintosh) in a plethora of emotive words like *marvellous, splendid, most precious page of modern architecture, miraculous, passionate*?

Bruno Zevi—l'Espresso

From the point of view of non-Italians, however, there is little doubt that Bruno Zevi made his most valuable contribution to the Neoliberty debate in *l'Espresso*, the weekly paper that has been described as 'an Italian *New Statesman* with *Life* magazine pictures.' In the issue for May 24, 1959, he wrote one of his regular columns on architecture, giving it the title *Torniamo al Liberty* (Back to Liberty), and drew

attention not only to Banham's article, but also to a recent study of south Italian *Art Nouveau* by Renato Defusco (*Il Floreale a Napoli*), and deduced (from a reading of the latter) three motives towards a revival of *Art Nouveau* in Italy. He described them thus:

(1) An historical pressure. The Modern Movement reached Italy fifty years late compared with other European countries. Hence the solutions were applied before the problems had been tackled, and modernism entered the building scene only to make it squalid. We welcomed functionalism without having lived out its precedents, the Arts-and-Crafts revival, nineteenth-century engineering, Art Nouveau and proto-rationalism. It is all the more logical therefore to try today to rediscover and revalue our few works of the beginning of the century that reflect—in however faint and provincial a manner—the grand currents of renewal.

(2) An opportunity for critical revision. The Rationalists over-abused the nineteenth century and the *floreale*, feeling no need to distinguish them from their later imitators. . . . The masters of Liberty are artists of the very first rank, to be classed not as simple forerunners of the modern movement, but as protagonists of one of its most fruitful periods.

(3) A nostalgic tendency. Basically, these our grandfathers did less harm, even while plastering their architectural pastry with whipped cream, than our fathers and elder brothers. Their palaces and villas, in spite of their decorative affectations, are less sickening than the pseudo-modern suburban quarters of skyscrapers and stridently coloured constructions currently in fashion. They reflect an illusion, pathetic but legitimate, of early Italian capitalism intent on de-provincializing the country.

These three motives . . . could easily become twisted to support the rise of a Neoliberty. And so much, precisely, has happened in Milan. From such false reasoning descends

. . . the infantilism of sudden cultural conversions, the artistic and—above all—the human decadence of which Neoliberty is the most obvious symptom. . . . In a culture that tires of ideas and first principles even before they have been realized or made concrete, and suffers a fever of originality and artificial vitality, it was logical for the Rationalists to feel an urgent need to surpass themselves—even by going backwards. They braved out the difficult times, when a desire to build modern meant going hungry . . . but now prosperity has corrupted them.

* * *

Banham: No comment needed; except that if Zevi, who is an Italian, feels moved to say such things, which are what I said only more so, then perhaps I am not so insensitive to the subtleties of the Italian situation as Rogers and others claim I am.

Piccinato and Quillici

Finally, four comments from above the battle, so to speak, deserve note. A group of architectural students in Rome, led by Giorgio Piccinato and Vieri Quillici, took the opportunity to send a manifesto, and observed:

. . . Latest Italian 'performances' that you rightly criticized in AR . . . clearly prove the unprogressive background of our post-war architecture. Only in taking up the spirit of the modern movement do we think it will be possible to get out of our present situation. To see that the AR is in accord with these ideas has been very agreeable to us. Our heavy problems of building and planning can find no solution without a deep criticism of (architecture's) ethical meaning.

Cesare Brandi—Corriere della Sera

The opinions of the Italian equivalent of the 'Top People' who read *The Times*, were expressed in an article by Cesare Brandi in the *Corriere della Sera* for July 10, 1959. Since this was written for a non-specialist readership, it was mostly taken up with explaining the issues at stake, and hoping in an avuncular way that Reyner Banham's 'Lavata di Testa' had been applied at the right moment to call younger Italian architects to order. But it is worth noting, in passing, that Brandi alone appeared to agree with Banham that *Art Nouveau* was the last of the old styles, not the first of the new.

Giovanni Bernasconi—Rivista Tecnica

From the side-lines, the well-informed Lugano magazine, *Rivista Tecnica* (8, 1959), made a general survey of the current bad press for Milanese architecture, back to, and including the *Casabella-Architecture d'Aujourd'hui* polemics of 1957, and was the only overseas commentator to recall the ARCHITECTURAL REVIEW's earlier strictures on Milanese revivalism, such as the speculation on the inspiration of the *Torre Velasca* which appeared in 'The Exploring Eye' (AR, November, 1958). Giovanni Bernasconi concluded his survey with the observation:

. . . and, certainly, contemporary Italian architecture has no need for research into Dutch Expressionism . . . the eclecticism of Berlage; Italy has *altro cielo e altri colori*.

* * *

Banham: Readers may remember Sig. Bernasconi as one of the most energetic defenders of the reputation of Antonio Sant'Elia, and his observations are—unlike those of the Neolibertarians—fully in accord with the tradition of progressive design in Milan that Sant'Elia founded, and Eduardo Persico confirmed.

Crespi/Grisotti—Architettura Cantieri

The most truly Olympian comment, however, came from *Architettura-Cantieri*, the Milanese magazine that first raised the alarm at revivalist tendencies in North Italian architecture. In its No. 21-1959 it gave overwhelming proof of its concern with facts, rather than polemics, by printing a complete translation of Reyner Banham's article—complete even to the footnotes. The tone of its accompanying comments (either by Raffaello Crespi or Marcello Grisotti) suggests that *Architettura-Cantieri* is not very impressed with Neoliberty, which it accuses of missing the structural rationalism that was the true strength of *Art Nouveau*, nor with Dr. Banham whom it accuses (as usual) of missing the subtleties of the Italian situation, and of not attending to the strain of continuity during and since the rationalist epoch in Italy. Nevertheless it hoped that the 'already celebrated article' would put Italians

. . . on guard against the ills that can arise from our 'tendency to tendencies,' trying always for 'critical vindication,' or forcing on the natural reaction of the young by offering them cultural alibis and absolution, rather than a serene and severe attention that would be, in truth, more generous.

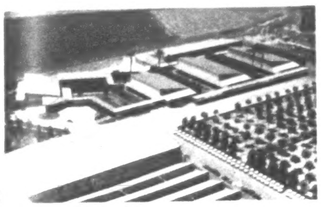
To run a 'tendency' magazine is doubtless amusing and frightfully *engagé*, but risky, for all that. There is a danger of incurring fillipics that are not entirely (like those of Banham) merited if gratuitous categorizations are instilled in the reader, if criticism and polemics are confounded.

* * *

Banham: Agreed. A plague o' both their houses, Roman or Milanese. Let's get back to architecture.

[illegible]uminium Prize Structure

[illegible] spection and reflect [illegible] The building [illegible] in fact the complex [illegible] linked by covered ways [illegible] provides canteen, social and [illegible] amenities for the factory [illegible] builds FIAT cars under licence [illegible] outside Barcelona. Architec[illegible] it is a welcome sign of [illegible] progressive thought in Sp[illegible] (as was the Spanish pavilion at [illegible]ussels, see AR, August, 1958) but it also has a curiously English air, as it were, a cross between our



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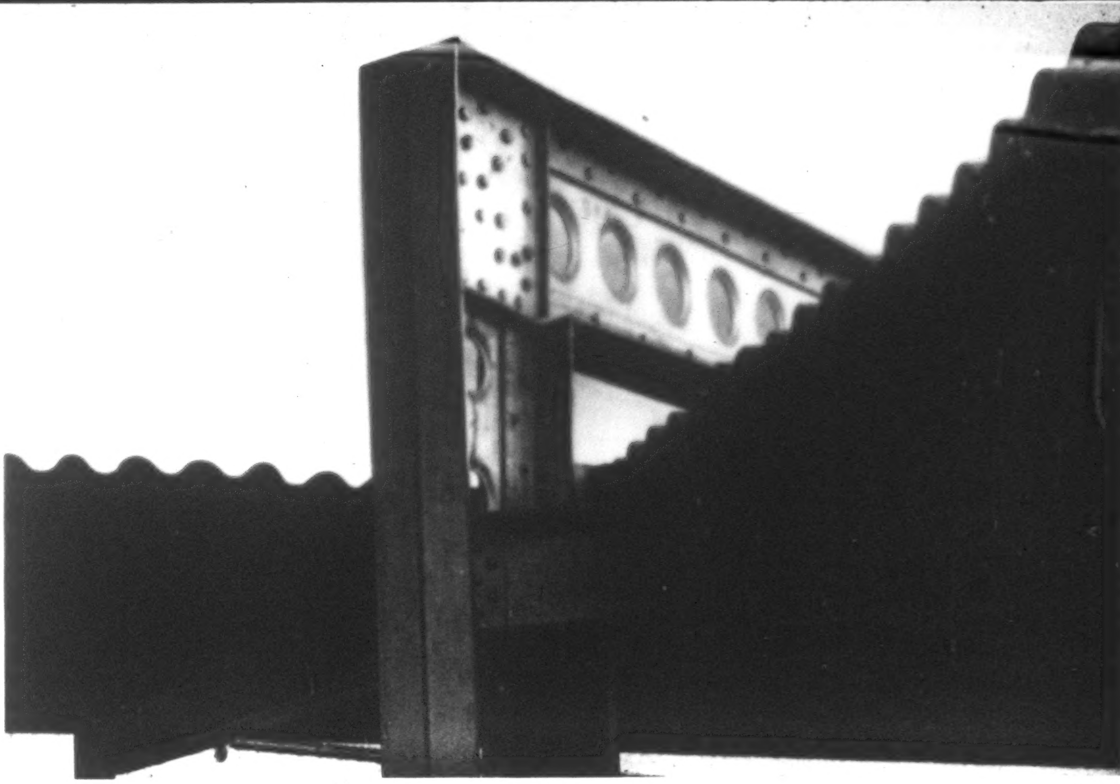
post-war schools and the early incursions of British modernists into tropical architecture. This similarity, 3, pervades even the interiors, where the lattice roof-beams, 2, have an immediately familiar look to British eyes, even if the Bertoia chairs do not. Here, of course, the resemblance is due largely to the techniques of construction and yet these techniques are, in fact, the least familiar part of the whole. We have almost as little experience in England of fabricated aluminium structures of this kind, as the Spaniards had when the building was put in hand — in their case, none, since this was the first in Spain. The detailing bears witness to the experimental nature of the work; a sophisticated, Prouvé-like use of pierced webs and tapered sections, married to what appears to be rather happy-go-lucky riveting, 4. However, if this riveting might alarm some purists, there is clearly nothing wrong with it structurally, and the frame and roof have successfully weathered two winters of Barcelona's boisterous sea-side climate.



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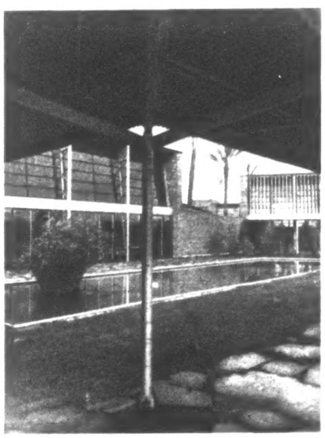

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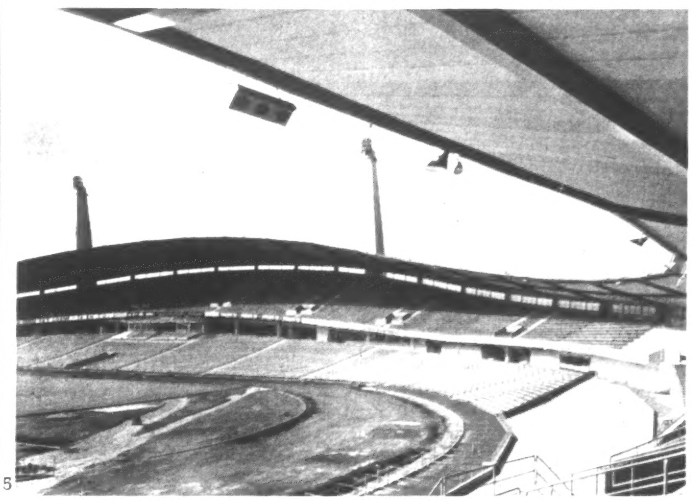
WORLD

a monthly review of outstanding buildings abroad, and new developments in world architecture.



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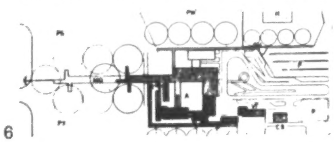
Nya Ullevi Stadium

A 55,000-spectator stadium is a sizable one anywhere, but in Sweden it is immense. Yet Nya Ullevi, in Gothenburg, has more than its size to recommend it. The designers, Fritz Jaenecke and Sten Samuelson, have departed completely from the symmetrical, formalist orthodoxy that still circumscribes many stadium designers, and attempted a 'functional' form that distributes standing and sitting accommodation around those parts of the perimeter where it is most in demand — *not* around the curved ends behind the goal-posts or where most cinders fly from the speedway. The result is a lopsided plan because seated spectators occupy more depth than standing ones,

but what makes this asymmetry immediately striking is the consequence of roofing it, 5. The roof rises and falls like a roller-coaster in order to take up varying depths of stands of approximately the same angle of rake, and this increase in depth becomes so marked on the 'seats' side that normal cantilevering (sufficient elsewhere) has to be reinforced by wire-bracing from above, the two pylons that provide the anchorages also serving the more conventional purpose of carrying floodlights.

Jet-port for Milan

Many an air-traveller to or from Milan must have occupied his mind with puns about 'thinking ill of Malpensa' as he kicked his heels in what was, until recently, one of the slummiest airports in Europe. Now, however, in preparation for jet services to Italy's second city, Malpensa is in course of complete renovation and rebuilding in a local variant of the glass-and-steel style, 7, increasingly (and justifiably) favoured for airports. The new buildings, designed by Vittorio Gandolfi, shown in black in 6, are the first phase of an extensive scheme, intended ultimately to handle medium sized air liners on



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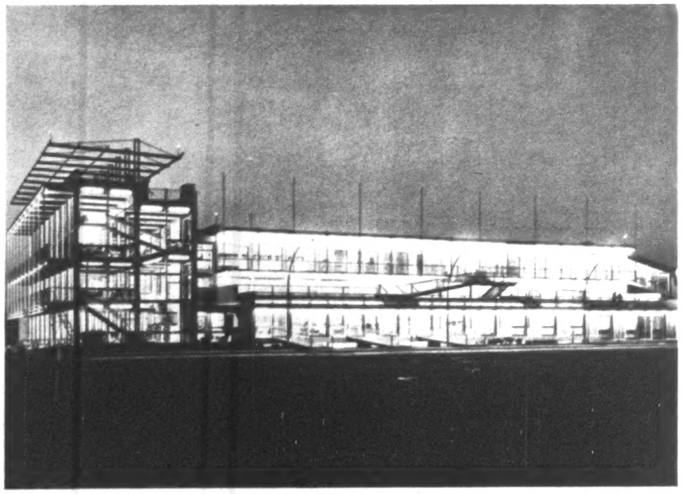
either side of the main block, and big jets from a projecting 'passenger finger' shown in two phases of extension in the plan. The interiors, largely the work of Gabriella Gandolfi Albertazzi are, as might be expected, in a considerably lightened-up, and straightened-up, version, 8, of the super-de-luxe airport style established at Ciampino, the airport for Rome. The result adds up to a terminal building that will certainly be compared to Gatwick (AR July, 1958).



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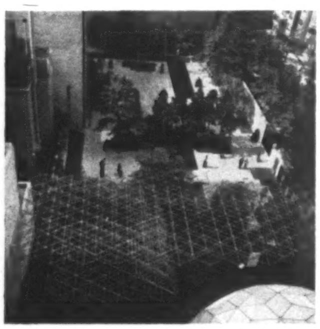

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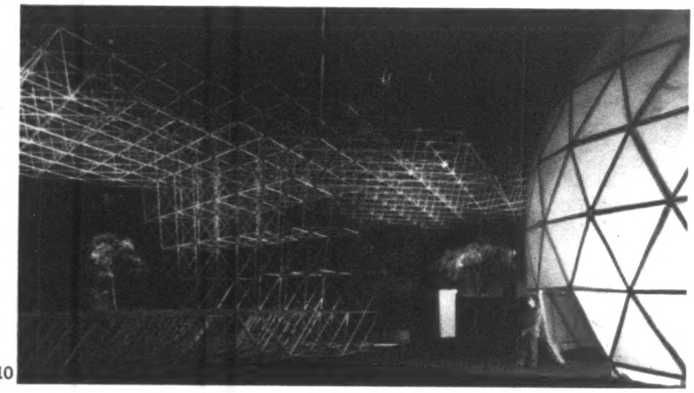
Octet on West Fifty-third Street

'Although he is not directly concerned with aesthetics,' as Arthur Drexler's catalogue-introduction admitted, Buckminster Fuller has recently been given an exhibition at the Museum of Modern Art, New York. The exhibits wrought a massive transformation on the familiar landscape of Philip Johnson's sculpture-court, 9, behind the museum (cf. AR, Nov., 1959, p. 253), and included the MIT rigid radome, built up from plastic dished units bolted edge to edge, a discontinuous compression strut, now known as a tensegrity strut, derived from the work done for Fuller by Kenneth Snelson at Black Mountain, and a large cantilevering structure with overhangs of sixty feet one way (to the right in 10) and forty feet the other, toward the back wall of the museum. This was one of the largest demonstrations so far of the Octet (octahedron-tetrahedron) truss employed to create flat surfaces of wide extent, and invites comparison with the flat trusses of Konrad Wachsmann's B36 hangar (AR, *World*, August, 1955). The comparison will show that, on analysis, the Fuller Octet ventures much further into the deep waters of three-dimensional geometry—Wachsmann's structure depends on a square grid in plan, and thus gives a tidier outline; Fuller's, based on the tetrahedron, gives parallel sides at 60 degrees between one set and another, and thus a wavy edge when used to make rectangular forms, 10, but should turn out much lighter. Comparisons are virtually impossible, but the fact that this Octet truss with its span of over 100 feet comes in at under four tons, suggests that as a structure type it must have an inherent weight advantage.



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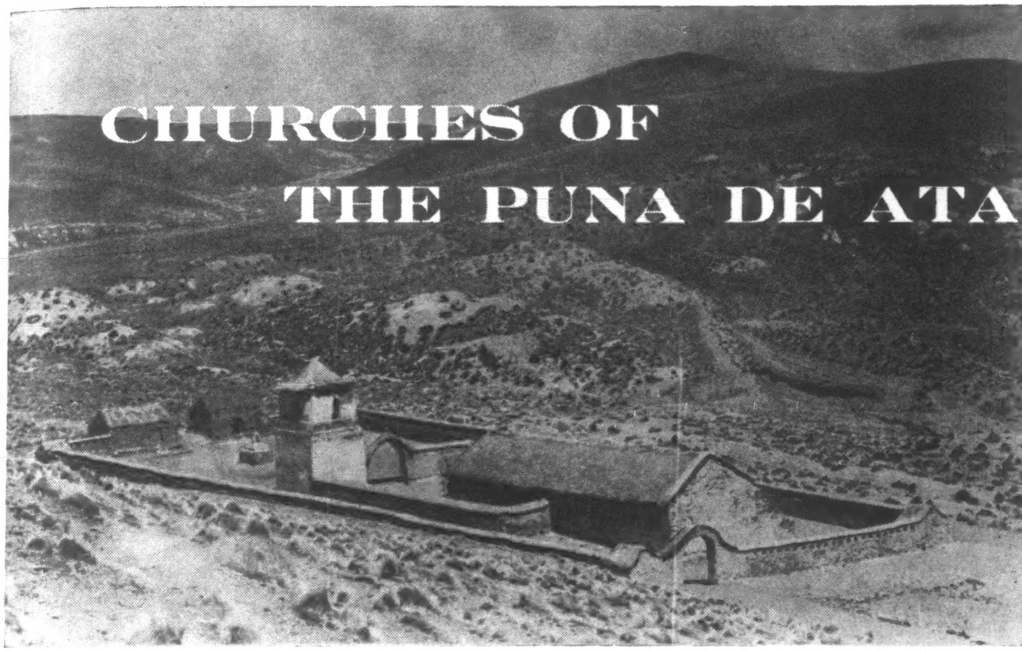
PAUL DONY

CHURCHES OF THE PUNA DE ATACAMA



If there is an architecture where the Lamp of Sacrifice (as Ruskin called it) burns bright, it must surely be that of the churches of the high and inhospitable Argentine face of the Andes, built and maintained with the utmost fortitude by both priests and laity. The twenty-odd that still survive are described and illustrated by Paul Dony in the article that begins below.

In 1542 Cristóbal Vaca de Castro, who assumed the government of Peru after the assassination of the Conqueror, Francisco Pizarro, decided to send out an overland expedition to the River Plate. At that time, the whole of the Inca empire, including the old capitals, Quito and Cuzco, had fallen into the hands of the Spaniards. Both Lima and Sucre (first known as La Plata or Charcas) had been founded, whereas at the other end Buenos Aires, tentatively established in 1536, had been abandoned for Asunción del Paraguay after five years, only to be refounded in 1580.

Two hundred well-trained men left Charcas under Diego de Rojas and started due south, following the ancient Inca road across the high plateau and accomplishing the historic first 'entrada' into the territory known as El Tucuman—to-day's north-western provinces of Argentina: Jujuy, Salta and Tucuman. Rojas died on the way, but some of his companions eventually reached the Paraná river.

After traversing the highly eroded table-land that stretches south of Potosí, the old trail (Camino de los Incas) runs along the eastern slopes of the Andes, descending into the plains somewhere west of the present city of Tucuman and, probably for reasons of safety, keeping clear of the Humahuaca Valley that was reconnoitred later and then became the main link between Bolivia and Argentina. The country—the Puna de Atacama—is bleak and desolate, windswept, stony and treeless, practically the only growth being a low, blackish shrub ('tola') and an occasional cereus. It is so thinly populated even now that, without coming across a single dwelling, one may cross distances of thirty miles such as the steppe appropriately named Campo de la Paciencia. Silence is impressive, and even the human voice loses its timbre owing to the high altitude.

The lower route, climbing northwards from Jujuy to La Quiaca through the Quebrada de Humahuaca, is sparsely dotted with tiny villages, but the effect of the scenery is enhanced by rugged and colourful mountain ranges closing in on both sides until the plateau is reached a short way off the Bolivian frontier.

The churches with which this brief survey is concerned, scattered along both routes, are all included within the former boundaries of the Argentine province of Jujuy. From south to north, over a distance of 180 miles, the altitude rises from 4,000 to 10,000 ft. The Tropic of Capricorn crosses this region more or less half way between the city of Jujuy and the northern boundary: the villages of Huacalera, on the valley road, and Susques, on the Inca highway, lie a couple of miles off it.

Franciscan and Dominican friars probably came down from Peru as early as 1550. A few Jesuits followed about 1585, joined later by a fresh group proceeding from Brazil. Founded in 1593, the city of San Salvador de Jujuy gradually became an important centre, second only to Salta, on the muleteers' trade route to the mining districts of Potosí. In his itinerary from Buenos Aires to Lima ('El Lazarillo de Ciegos Caminantes,' 1773) Concolorcorvo gives a vivid picture of the perils and amenities of the road and describes its many 'postas' or relays. Travel was active through the valley and it is easy therefore to account for the establishment and maintenance of small places of worship all along the Quebrada. Not so, though, in the Atacama desert. Nevertheless, not one of the lonely Andean villages along the Camino de los Incas was neglected and, in the course of two centuries, the padres, with uncommon fortitude, raised chapels and oratories wherever they could rely on their being taken care of by the dwellers, their own visits being few and far between. It should be borne in mind that, up to the present day, the number of parish churches in these provinces is exceedingly small and limited to the bigger centres; most of them are modern constructions, devoid of any architectural interest. The country chapels are visited once or twice a year by a priest, who then administers at one sitting all the sacraments that have been left in abeyance: baptisms, confessions, Holy Communion, marriages.

Distributed over an area three times as large as Wales, some twenty of the old structures still exist. Most of them were built in the eighteenth century, a few belong to the second half of the seventeenth. Probably one out of every three remained unknown to scholars and artists until thirty years ago. In most cases, documentary evidence is lacking as to their erection and the restorations they have undergone, so that any attempt at a chronological classification is impossible. Sometimes a wooden lintel or a bell has a date carved or embossed on it; this, however, is seldom an indication of the building's age, since such parts have often been re-used from one to another, owing to the difficulty of securing new ones for lack of raw material or transportation.

Utmost simplicity is the rule. Of necessity, without architects except the self-trained padres, and without skilled workmen, technical problems had to be reduced to a minimum. In fact, the first country chapels—many of them superseded later by somewhat more elaborate structures — were of the 'rancho' type: rough rectangular huts, only larger than those used as dwellings. Construction was elementary: adobe walls (up to 6 ft. thick), packed earth floor, double-slope roof with coupled rafters. A tiny lateral sacristy was added at the far end and a squat, square and bulky tower built on one side of the front. The plainest arrangement consisted of a narrow external staircase applied against the nave wall and leading up to the belfry. (Antofagasta de la Sierra, 7, now pertaining to the province of Catamarca.)

Whereas in New Mexico, where evangelization was massive, the friars at once started raising churches of ambitious size, designed to accommodate large crowds, the exceedingly thin population of the Andes provinces only required chapels of very modest proportions. But a more capacious and refined type slowly evolved out of the most primitive, though without ever losing its peculiar character of intimacy.

The single-nave plan was invariably adhered to and stress should be laid first on some negative features prevailing over the whole district: there is no indigenous or 'mestizo' decoration of any kind, there is no attempt ever to develop anything like a lateral façade, openings are few and small, bell-gables ('espadañas')—so abundant and graceful in the more southernly provinces—are absent, and so are outer galleries.

The first enrichment very likely was the choir-loft ('coro alto'), a wooden platform spanning the nave above the doorway and directly accessible from the belfry staircase. When the flanking tower rises higher, with a hollow core and an upper story to lodge the bells, it is commonly entered at ground level from the front and either a ladder or an inner staircase gives access to both the belfry and the choir-loft. Cochinoca and Coranzulí have twin towers. Isolated towers, as at Rosario de Coranzulí and Uquía (a Jesuit halting-place, one

day's march from Jujuy) are exceptional. Sometimes the tower has three stories, the cubic masses of which, superposed and set back, are relieved by unsymmetrical fenestration; but they certainly are no improvement on the primitive, sturdy, overpowering bulk of the tower at Acoyte (8—now pertaining to the province of Salta).

Probably the most striking feature of these Andean churches is the 'soportal,' a double-sloped porch obtained by simply extending over the entrance the roof's framework,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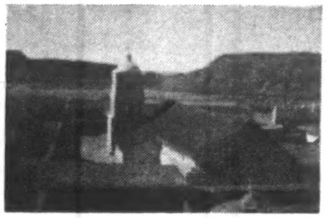
which rests on the protruding nave-walls (Huacalera, 3; Tumbaya, Yavi, Susques, Yruya).

Either located in front of the church or surrounding it, the 'atrio' is a walled-in enclosure of large size. Though also to be found in some Quebrada villages (Uquía, Purmamarca), it is typical of the Altiplano or high plateau and is an element of great distinction and beauty. With its arched doorways and the simple but effective openwork decoration of its walls—the upper courses of adobe-bricks being placed obliquely on their smaller sides so as to form a row of pierced chevrons under the thatched covering—the 'atrio,' extending its smooth horizontals across the plain or against the arid, unshapely background of a nearby ridge, turns the sleepy village church into a harbour of peace and meditation. Sometimes (Rosario de Coranzuli, titlepiece) there is a double enclosure, sometimes an outer and an inner courtyard as in Casabindo, 2, where the outer, larger one has four cul-de-four altar stations engaged in its walls, two facing east and two facing west. These are not open chapels ('capillas abiertas' or 'posas') as in Mexico, where mass could be celebrated outdoors whenever the congregation exceeded the church's capacity. The Andean open-air altars are actually 'sitiales' wherein to rest the monstrance in which the Host is carried in procession: the French word 'reposoir' conveys the idea clearly. A perfect example is Susques, 3, 11, where four 'sitiales' are built against the walls in the corners of the square atrio enclosing the chapel. They are disposed in such a manner that every one of them faces the procession as it liturgically moves round the court in an anti-clockwise direction. Such an arrangement was traditional in Spanish cloisters and the monks, who would have met blank walls if they had walked clockwise, encountered decorated niches or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fountains when moving in the other direction; very few examples have been preserved intact, but one is to be found in France in the fifteenth-century cloister of Cadouin (Dordogne).

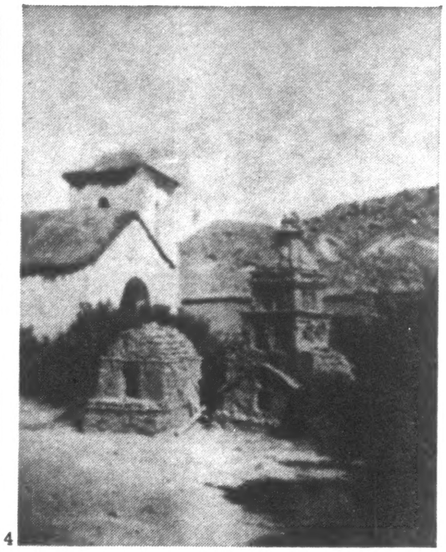
In some places the cemetery adjoins the atrio, elsewhere it is enclosed in it (Casabindo): diminutive clay monuments, 4, handmade and pathetic, are built on top of the tombs; crosses are placed on them on All Saints' Day, until which time they are kept within or near the church.

Interior ornaments and fittings are generally unassuming and of a poor artistic quality. Altars are often built in. Costly wooden retables (there is a fine one in Yavi) were neither easily obtainable nor advisable in these lonely parts: in case of aggression, the padres had to collect their valuables quickly and this was easier if they simply lay in niches cut in the wall; there was also less danger of fire.

Of exceptional interest are the magnificent pulpits in Jujuy cathedral and at Yavi (the Marquess of Tojo's seat). Though belonging both to the Cuzco school of woodcarving, the former is by far the more significant. Jacob's ladder is figured on the banisters and the Evangelists on the panels of the bowl, but curiously enough two of the attributes are inverted—St. Lucas appearing with the Lion, 10.

In Uquía and Casabindo, the walls of the nave are hung with late seventeenth-century paintings, quaintly representing winged angels dressed up and armed like musketeers, so-called 'ángeles caballeros,' frontispiece, page 302.

Clay and adobe are used where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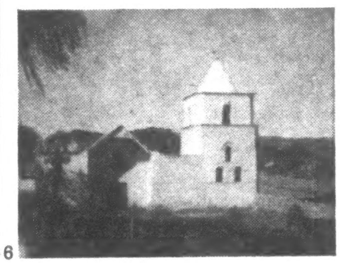
church furniture would be too expensive, as in the case of a low bench ('poyo') often running along the inner wall (Casabindo); touching in its plainness is a small confessional at Antofagasta de la Sierra, made out of a low seat between two rough adobe partitions, each pierced with a tiny latticed opening.

The giant cactus, or cereus ('cardón'), replaces timber in many instances: sawn into boards or logs, it yields an exceedingly useful and decorative material, somewhat soft and pulpy, whitish, with curious veins and innumerable rows of holes. Where wood is specially scarce, as in the Puna de Atacama, 'cardón' is turned into light beams, like those supporting the choir-loft at La Cueva, or rafters, doors and panels. Confessionals are built of it at Humahuaca, where a local 'indústria del cardón' is being developed. Both at Susques and at Casabindo the pulpit is made of this material: a whitewashed bowl for the former, a balustered balcony for the latter. A short distance from Humahuaca, the so-called Santa Bárbara Tower, now in utter neglect, has a door, 9, entirely made of cereus boards fastened by straps of undressed leather; when the author and his wife opened it, they had a surprise: a skull lay behind it. For centuries, raw leather has been used in the northern provinces instead of nails or wire to tie rafters and beams together; the straps are fastened when wet and will last for ever.

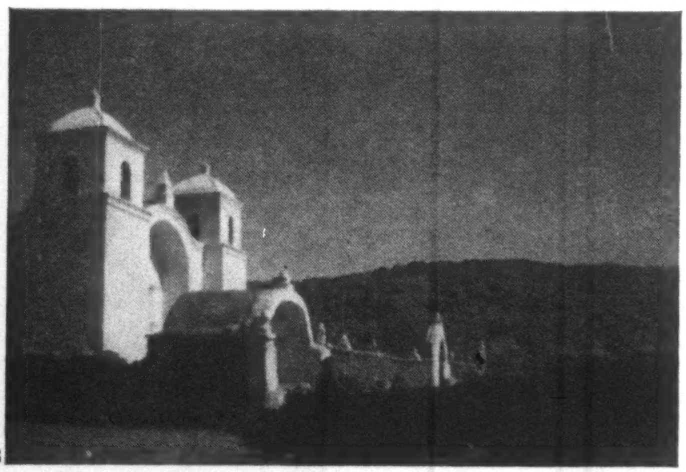
When Ruskin, a hundred years ago, wrote of the spirit that offers labour and time because they are precious, when he said that what matters is 'not the gift, but the giving,' he might have been thinking of the humble Andean sanctuaries. For, in spite of their poverty, all of them disclose some effort towards beauty, however awkward and modest. The string courses and attempted blind arcade at La Cueva, 5, possibly illustrate this better than any other example. But there are many more details, the charm of which is increased by the coarseness of the material and the 'naïveté' of the treatment: 'guardapolvos' or dripstones (6—Yavi, here designed to keep off dust instead of rain),


6

projecting beam-heads over a doorway (Santa Victoria), indented and carved lintels (Huacalera, Casabindo, Yavi). The 'Lamp of Sacrifice' is still burning high up in the Andes.

Such enrichments are all the more lovely as the materials employed are in fact reduced to three: clay (stone, with the barrel vault, has been used in Casabindo only), cereus and, for thatching, a kind of reed called 'totora.' Nature has nothing else to offer. Andean architecture is part of the soil and vigorously attached to it. The mud-coloured villages, crouching low under the icy winds, fiercely hold their own against the desert—the desert that starts right beyond the last house's backyard. But the minute a rancho or a chapel is abandoned, as soon as fails the care of man and the breath of life, it crumbles down and breaks up into dust.

Adobe walls, a thatched roof—possibly covered up with mud ('torta de barro')—a touch of whitewash here and there: the village merges completely into the surrounding scenery. How could one talk of style? In the Andes, architecture is ageless. And, as in the Arab world, there is only one style: the same ever. 'Celui de toujours,' said Jérôme et Jean Tharaud.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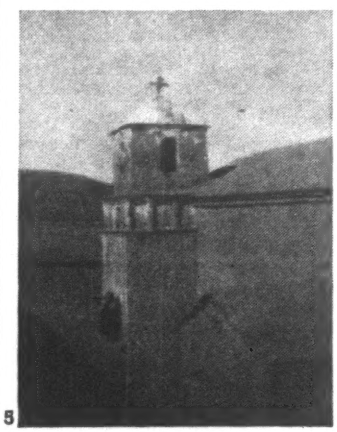
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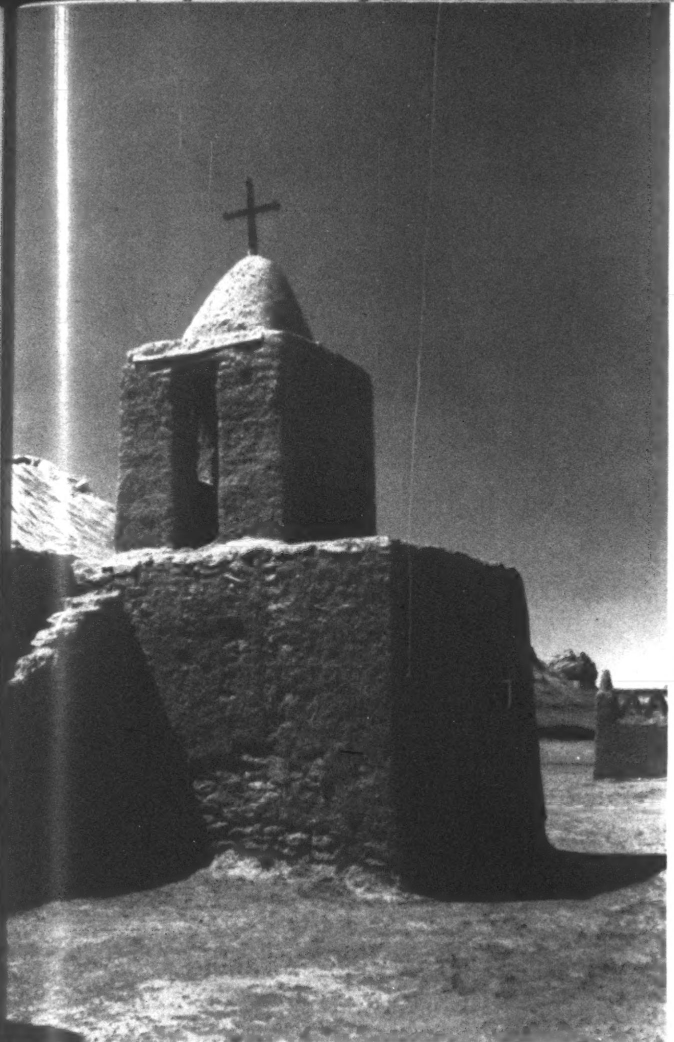

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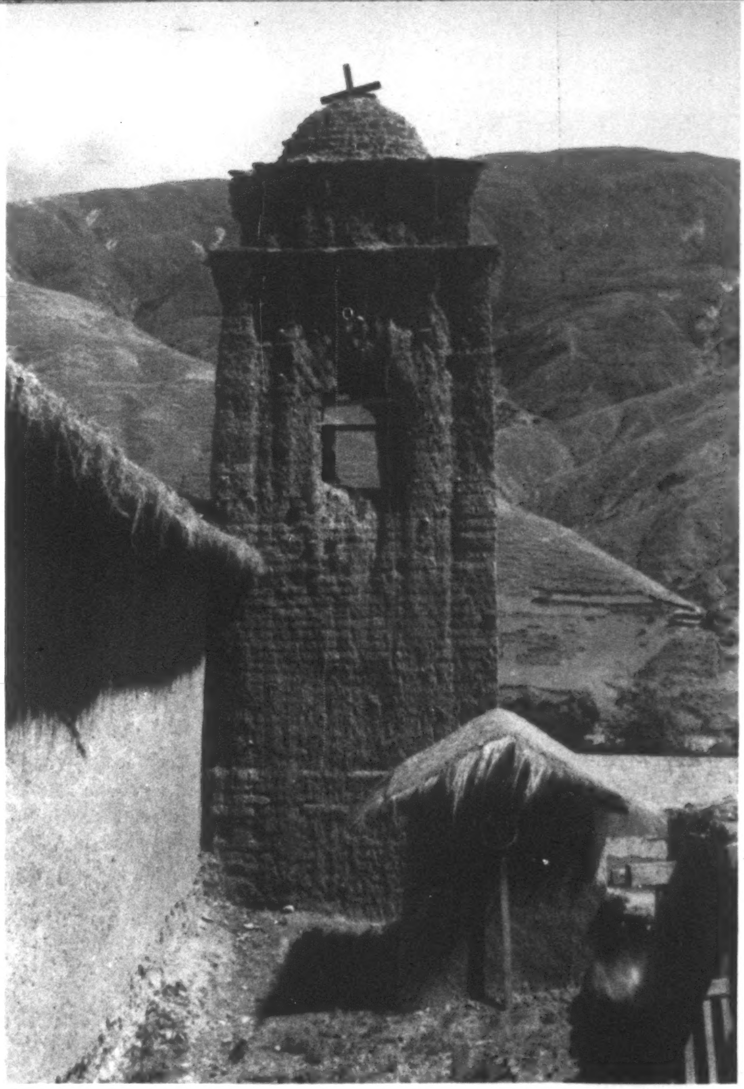

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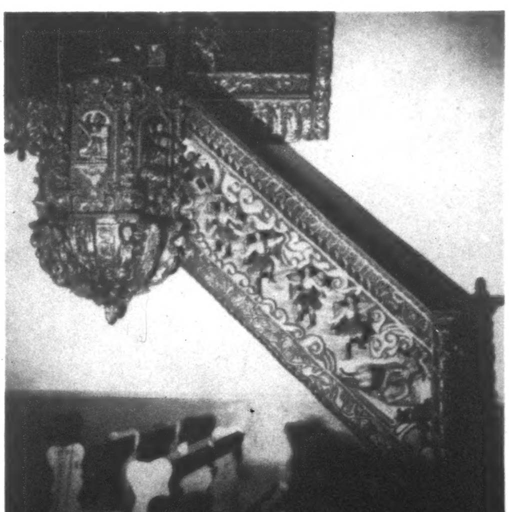
7, the belfry of Antofagasta de la Sierra, with an external staircase.
8, the tower at Acoyte in the province of Salta.
9, the door of the Santa Barbara Tower is made from boards of giant cactus fastened by leather straps.
10, the carved pulpit in Jujuy cathedral.
11, the bell tower at Susques.



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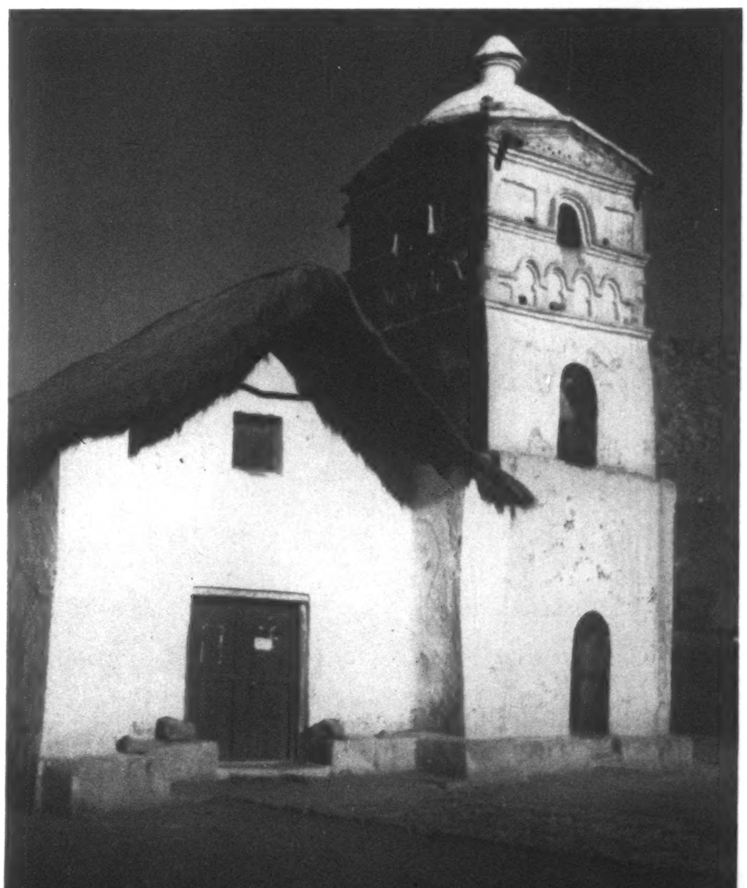


11

THREE SECONDARY SCHOOLS IN THE WEST MIDLANDS

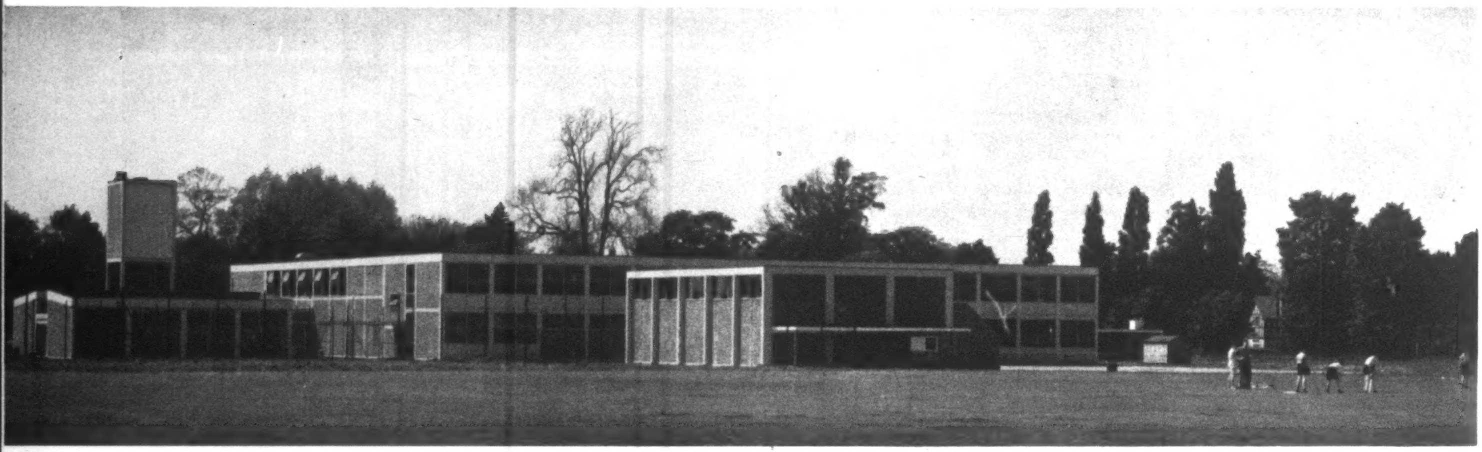
ARCHITECT: FREDERICK GIBBERD

These three schools, two in Worcestershire and one in Warwickshire, are all in rural surroundings and all three are comparatively small for secondary schools.

The two Worcestershire schools, at Kidderminster and Upton-on-Severn, have level sites and are compactly designed around garden courts, to leave the existing environment as undisturbed as possible. Both schools are two storeys high with the ancillary buildings, such as workshop blocks, single storey. In the larger of the two, at Kidderminster, the single storey blocks are arranged as projecting fingers around a main block.

The school at Henley-in-Arden has a much more irregular site, both in its contours and tree planting, and is, therefore, more irregular in plan form and silhouette. The central teaching block is three storeys high, to be in scale with the existing trees and to overlook a small valley to the east.

All three schools are frame structures. Upton-on-Severn has a steel frame with infilling panels on the ground floor of grey concrete blocks and rendered and painted panels at first floor level; the Kidderminster school has a reinforced concrete frame with timber framed panels of glass and vitreous enamelled sheet steel. The Henley-in-Arden school has a steel frame cased in concrete, painted black which, together with the red brick infilling walls, gives it an affinity with the local half-timber tradition.

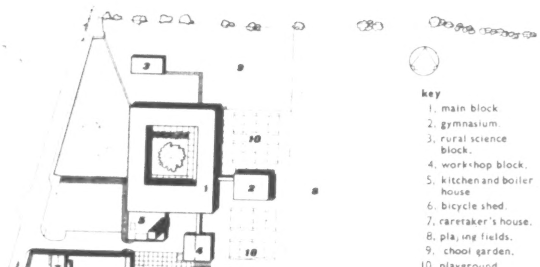


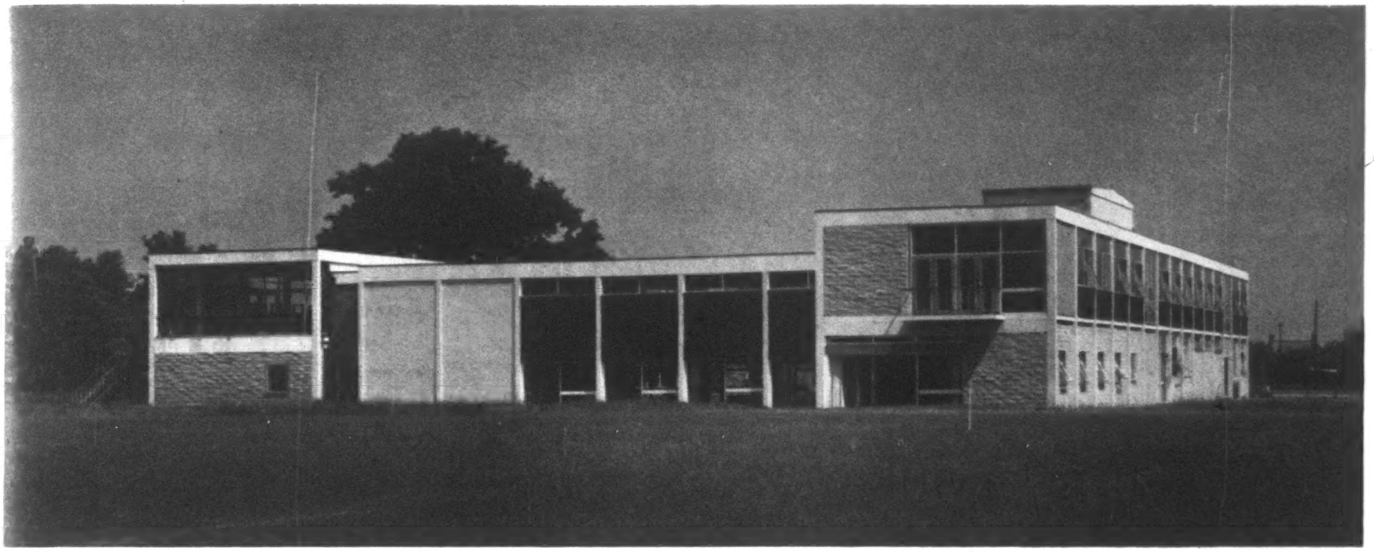
1

SIONHILL SCHOOL, KIDDERMINSTER

partner in charge: A. E. Kelsey

1, a view from the playing fields on the east, showing the main block with the gymnasium in the centre and the workshops on the left.





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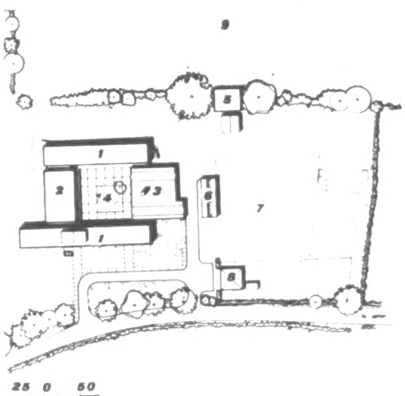
THE HILL SCHOOL, UPTON-ON-SEVERN

in association with: L. C. Lomas, County Architect

partner in charge: A. E. Kelsey

2. the school, seen from the east, is compactly planned around an internal court. Balconies outside the library on the right and the art room on the left look across to the Malvern Hills.

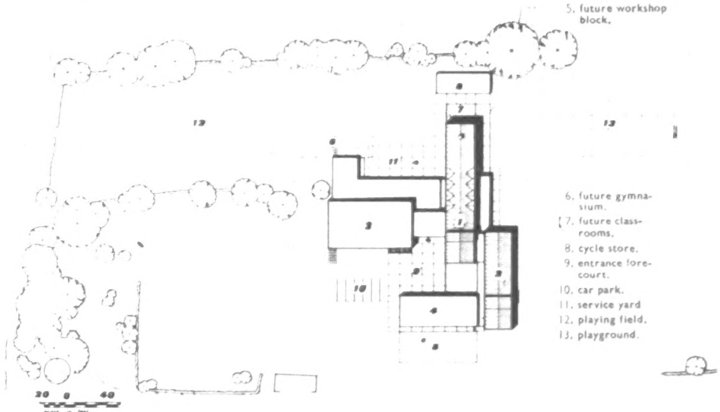


key
1. classroom blocks.
2. assembly hall gymnasium
3. kitchen, boiler room and workshop.
4. court
5. garden room and greenhouse
6. cycle store
7. playground
8. caretaker
9. playing fields

HIGH SCHOOL, HENLEY-IN-ARDEN

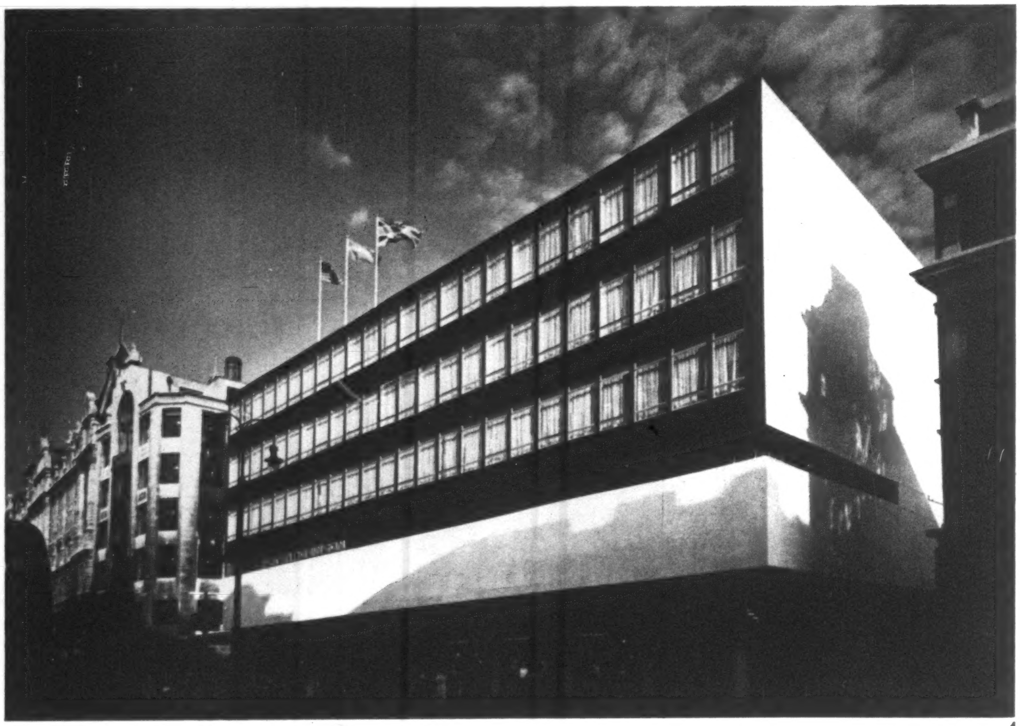
in association with: G. R. Barnsley, County Architect

associate architect: J. B. Forrest



key
1. three-storey teaching block.
2. two-storey teaching block.
3. assembly hall.
4. workshop block.
5. future workshop block.
6. future gymnasium.
7. future classrooms.
8. cycle store.
9. entrance forecourt.
10. car park.
11. service yard
12. playing field.
13. playground.

3. the two and three storey teaching blocks overlooking the playing fields. The roofs continue the line of the surrounding trees.



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4, *the Strand frontage, with the concrete screen wall to the first floor and recessed clerestory window above.*
5, *the main entrance at night: the screen wall is now dark with the clerestory window a bright strip above.*
6, *the front of the Royal Society of Arts behind the store is better seen than previously, as the screen wall is set farther away from the columns and provides a clean, undetailed foil.*

DEPARTMENT STORE, STRAND, LONDON

ARCHITECT: DENYS LASDUN, OF FRY, DREW, DRAKE AND LASDUN

This is the first post-war building in England to make large-scale use of bronze cladding. The upper three floors of the main façade are entirely clad in pressed bronze sections and a bronze clad gutter is integrated with the cladding on each floor to minimize accumulation of dirt and bad weathering. The windows in the upper three floors have gold cellulosed frames. The main external feature is the first floor showroom, which has a reinforced concrete screen wall on three sides of the building, clad externally in reconstructed Portland stone. It incorporates a continuous clerestory window which is gear controlled and can be opened in lengths of 60 ft. in one operation, allowing the maximum flexibility internally for display purposes. An illuminated cantilevered canopy extends the whole length of the main frontage. Air doors are installed in the main entrance and circulation between trading floors is by means of escalators. The architects for the interior of the store are Design Research Unit.

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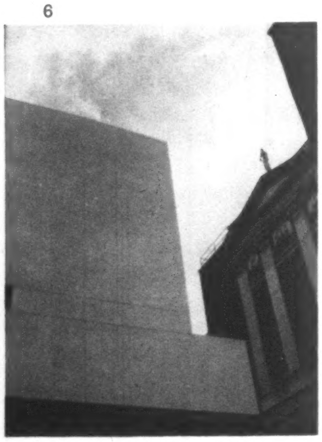
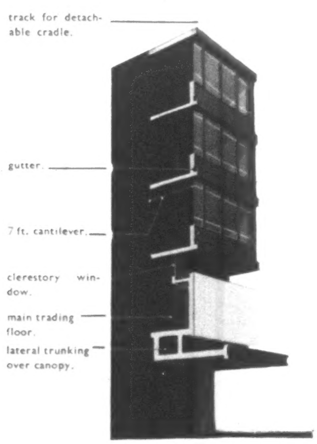
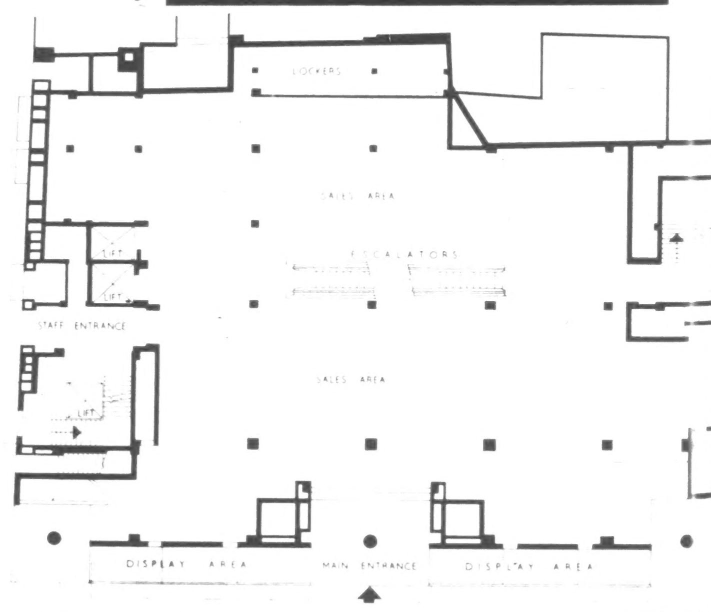
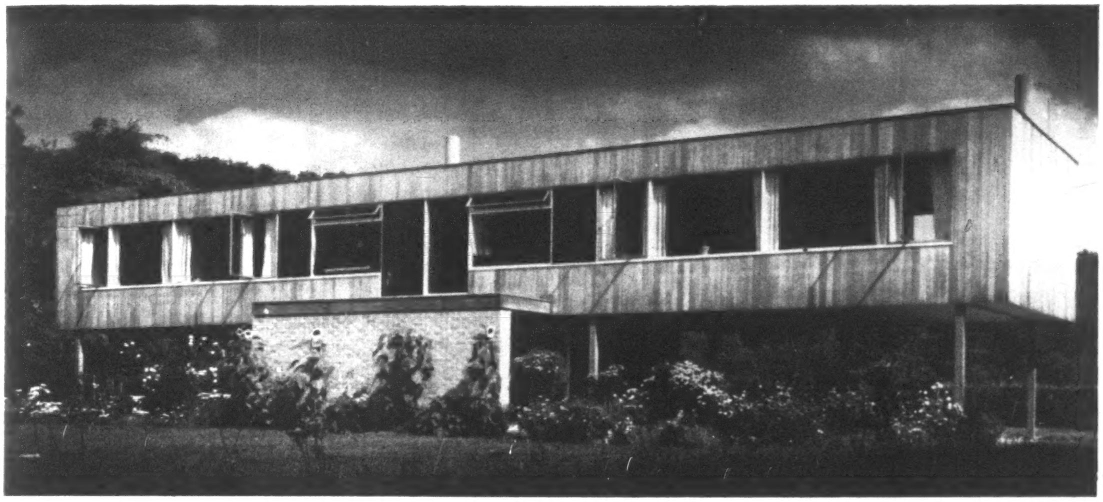




section through facade



ground floor plan



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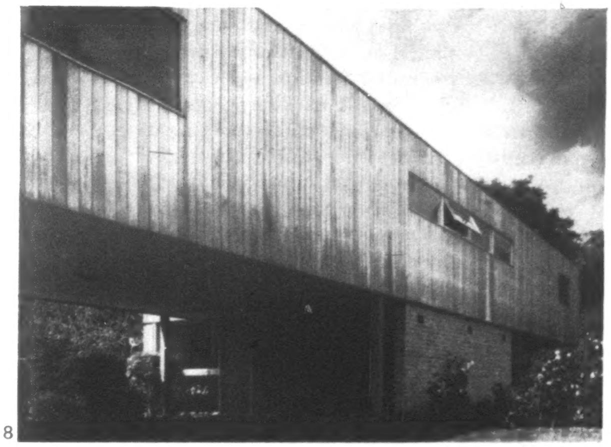
HOUSE AT MEDMENHAM, BUCKINGHAMSHIRE

ARCHITECT: JOHN FRYMAN

7, the west front, with the long windows to the bedrooms, study and living room.
8, looking under the house to the garage and entrance hall. Windows on this side are small and at high level.
9, the entrance hall with the overhanging living room beyond.

The site, near Marlow, has an open view to the east, with woodland to the west. The area is liable to be flooded and the main rooms have therefore been planned at first floor level. The whole house stands on four welded portal frames with eight welded box columns and perimeter steel beams. The foundations are of reinforced concrete, and apart from steel beams over the major window openings the framing terminates at first floor level. The walls are of 6 in. blocks and insulating plaster faced externally with Western Red cedar; the floors are softwood joists, with asbestos cement soffits, 4 in. of mineral wool and hardwood boarding. The roof is of compressed straw, three layer felt and chippings with hardboard or plaster linings. The bathroom is centrally placed to eliminate condensation, and all the plumbing is stacked in the centre of the house. The windows are purpose made with wood frames and metal inserts.



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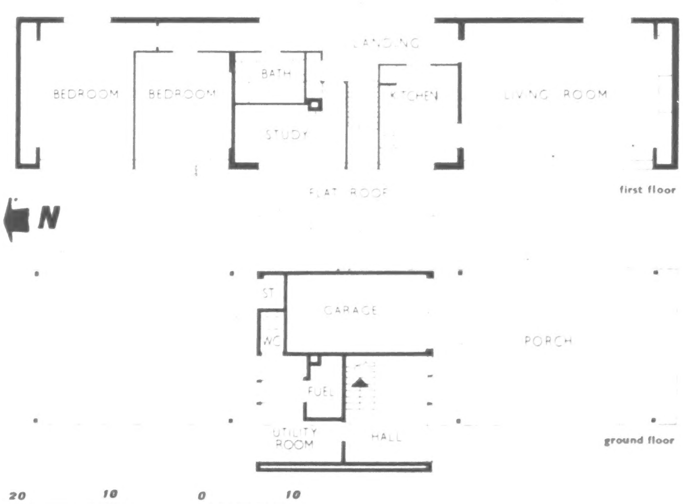

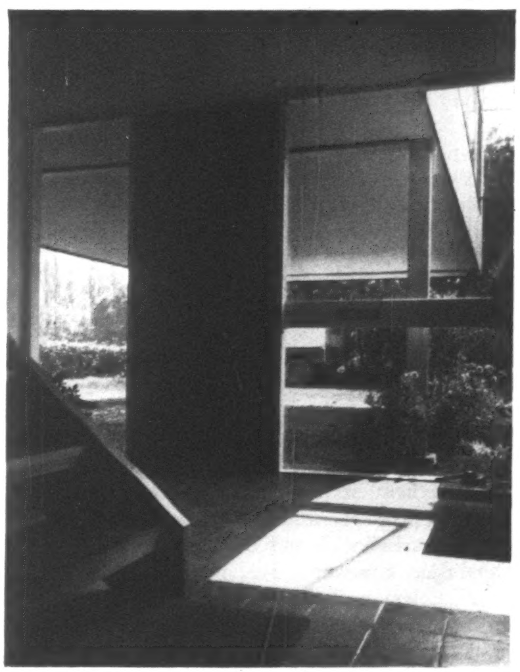

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EXHIBITIONS

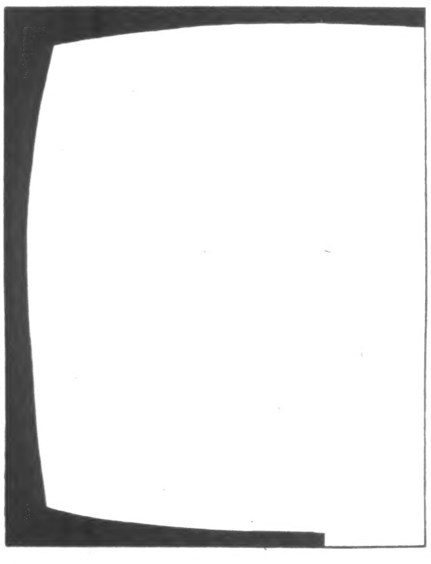
PAINTING AND SCULPTURE

The exhibition of paintings called 'Place,' held at the ICA and organized by Roger Coleman with the collaboration of three young English action painters, was an experiment in the mechanics of audience participation. It was all done with screens, and might have worked if the spectator had been given something interesting to look at while he was 'participating.' Coleman devised a neat ground plan for the screens, and short of using one of the pictures as a 'welcome' mat couldn't have done more to bring pictures and people together. The panels on which the pictures were painted were all 7 ft. high and came in two widths, 6 ft. and 4 ft. These panels were, with one exception, joined together to make two-, three- and four-fold screens, and, apart from those that zig-zagged out from the end walls, were painted on both sides. The screens were disposed diagonally across the gallery to form narrow alleys and small 'precincts,' and since the paintings started at the spectator's feet and rose well above his head he was hemmed-in by painted surfaces at almost every step on the walk. (The walls of the gallery were bare, and the bits that could be seen were painted black, as if in mock mourning for the passing of the old order.)

In the space at his disposal, the spectator remained too close to the panels to obtain an undistorted view of any work in its entirety, and it seems to have been taken for granted that this would automatically give him the sensation of being enveloped or invaded by the paintings. In practice, no such thing happened, and Coleman either left something out of his calculations or was let down by his collaborators. What was needed from the painters to make the scheme work was an expanding space job of the kind 'majestically demonstrated in Pollock's *Blue Poles*,' to quote from Coleman's guide to the exhibition; but it was quite evident that they thought Coleman's scheme would do the job for them, and that they expected their work to be given the same enveloping power as Pollock's as soon as it was stood against our faces.

If Coleman had had several hundred square feet of Pollock's drip painting to put on his screens the effect would probably have been unforgettable, but it would have been due almost entirely to the special nature of Pollock's work. It isn't merely the big canvas and the flat space concept, but the teeming repetitiveness, the long, flowing overlapping skeins of multi-coloured line that makes his drip paintings seem to surge through one when one goes close to them.

The large, flattish areas of colour in the panels provided by Coleman's three collaborators were too uneventful, and too uninteresting as texture, to serve his purpose. These young men—Robyn Denny, Ralph Rumney and Richard Smith—have already gained some reputation in *avant garde* circles. At present they seem to be intent on producing something analogous to the kind of music-making that's called 'minority pop'; I have the impression that in an arrogant sort of way they are deliberately spending their talent on something humbler than fine art! Coleman says that they have arrived at 'the significant aesthetic decision' to accept mass media 'as a legitimate body of reference,' and adds 'note Rumney's CinemaScope heads,' 1. These 'heads' are large, flat, two-colour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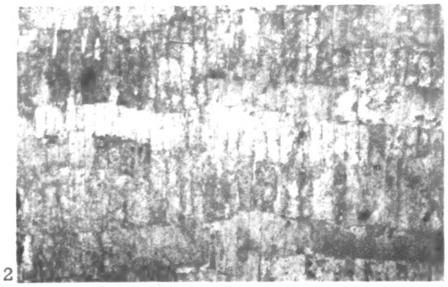
abstracts and are nice examples of what I mean by 'minority pop' painting. They are somewhere between 'fine art' and commercial entertainment, and are neither fine nor entertaining.

A number of Gwyther Irwin's extensive *collage* surfaces—shown recently at Gimpel Fils—possess qualities that would have lent success to Coleman's exercise in exhibition design. They have subtleties of tone and an all-over flicker and ripple of abstract minutiae that repays close examination.

Irwin makes his pictures out of posters that have been stripped off hoardings, and great soggy masses of this raw material are delivered to his studio a lorry load at a time. The backs of used posters serve his low-keyed, monochromatic sense of colour extremely well, and he only takes snippets from the printed side on the rare occasions when he feels the need to disturb his muted surfaces with a few bright accents. Whenever he fastens a single, perforated, broken-edged sheet of paper to a black background the effect puts one in mind of an ancient parchment with the inscriptions gone, and it looks too much like a boring museum item, but when he covers a support from edge to edge with small,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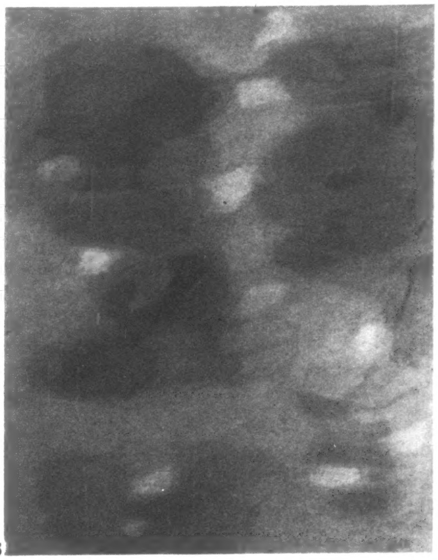
hand-torn pieces of paper closely related to one another in shape and tone his work acquires a hushed, meditative, faintly melancholy charm, and in such works as 'Lazy Man's Land,' 2, the sense of light and purity conveyed by his assemblages of greyish paper scarred and soiled by soot lines and stained by stale paste is a remarkable accomplishment.

Leon Kossoff, who has been exhibiting at the Beaux Arts, has almost the exactly opposite intention to Irwin. He turns paint into an unspeakably gross substance for the expression of a vision of mankind benighted by age, illness and sorrow, and dragging out his existence in cities irremediably soiled and hideous. I can't take it, but I'm prepared to believe that its desperate turgidity is a horrible form of


3

eloquence. His 'Building Site with St. Paul's,' 3, perhaps the most readable of his paintings, is one of two works which have been acquired by the Chrysler Museum.

The art of Bosch gave rise in the sixteenth century to a very flourishing school of imitators. They treated the naked human figure as an emblem of the degradation of physical life and were usually horribly complacent about it. Their pictures swarmed with sadistic, pornographic and scatological details which only got by because they were supposed to be listing the temptations of St. Anthony or the punishments which awaited sinners in hell. One of these pictures, an 'Inferno,' 4, attributed to Jan Mandyn, has found its way to the Arcade Gallery. There is a good deal of brutally comic grotesquerie to be discovered in the treatment being meted out to the tiny heaps of naked figures, but the painter is not particularly interested in devising new horrors and is rather unusually concerned with the plausible organization of his strip-like planes. The fantastic architecture of beer jugs and torture machines and the large raised platform on which one figure is being very slowly roasted catch the light from unseen fires and are coloured a delicious pink—though it occurs to me that the painter was probably trying to catch the colour of flayed human flesh.



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The Spanish painter Antonio Lago, whose work was shown for the first time in London in a recent mixed exhibition at Arthur Tooth & Sons, has, like Irwin, the impulse to convert his sense impressions into a luminous spaciousness. His abstracts are looser than Irwin's and the activity in them is a kind of fading and dissolving, 5. They have a cool sweetness which, due perhaps to the widespread influence of Sam Francis, is less rare in paintings of the abstract impressionist variety than in other contemporary work.

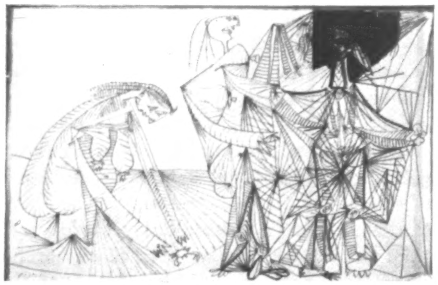
Sweetness is a quality rare enough in good contemporary sculpture, and for that matter has not often been considered a necessary virtue even in those periods when the gracefulness of the human figure was thought to be a not unworthy subject for the sculptor. The only distinguished figurative style that I can think of at the moment in which sweetness was persistently sought and captured was that evolved by the sculptors of the polychrome saints in Bavarian Rococo churches, and although these smiling, light-stepping, elegant figures are emblems of a belief in the resurrection of the body that we have had reluctantly to forsake, they are also potent images of the spirit reconciled with the flesh, the hope of which is still part of our make-up. Without aiming so high, and taking care to provide himself with an alibi which might pass as irony, Emilio Greco edges towards sweetness in his bronzes at Roland Browse and Delbanco. They are mostly of girls in bikinis, and it is a pleasant change from the nudges and winks of the organic abstraction to contemplate sculpture which at first sight appears to arise from a boldly

6

romantic response to the human body. But Greco's work is not quite the bold response that it seems to be. It is clear that he admires Modigliani, and has something of his spirit: like him, he is an eclectic, and his work contains brilliantly effective echoes of many sculptural styles, but by

comparison with Modigliani's paintings of the reclining nude, his figures are lacking in frankness and an inner core of conviction. Some aspects of his treatment seem to me to be an admission that the attributes of his model are clichés. He has bound her breasts out of existence, 6, as if in negative response to Hollywood and the brassiere trade and although he treats stomach and buttocks as compensatory felicities he uses tricks of posture that remind one of the fashion model. The skilfulness speaks for itself and the charm is inescapable, but true sweetness cannot survive the nervy game of blowing hot and cold.

7



Greco also showed a group of drawings in hatched line which were clever but empty and I find it rather surprising that a sculptor whose figures recall Italian coastal resorts has not contributed in his drawings to the classic modern theme of figures on the beach. A splendid example by Picasso, 7, one of the great masters of the theme, has been on view at the Hanover Gallery. It belongs to a series of large pen drawings made in 1938. The crouching figure on the left is looking at a crab, and she looks with almost everything she's got. The inventiveness, based on intense observations, with which Picasso conveys her total absorption is both comic and profoundly touching. **Robert Melville**

HISTORY

CHARLES CLERICI: CRAFTSMAN IN SCAGLIOLA

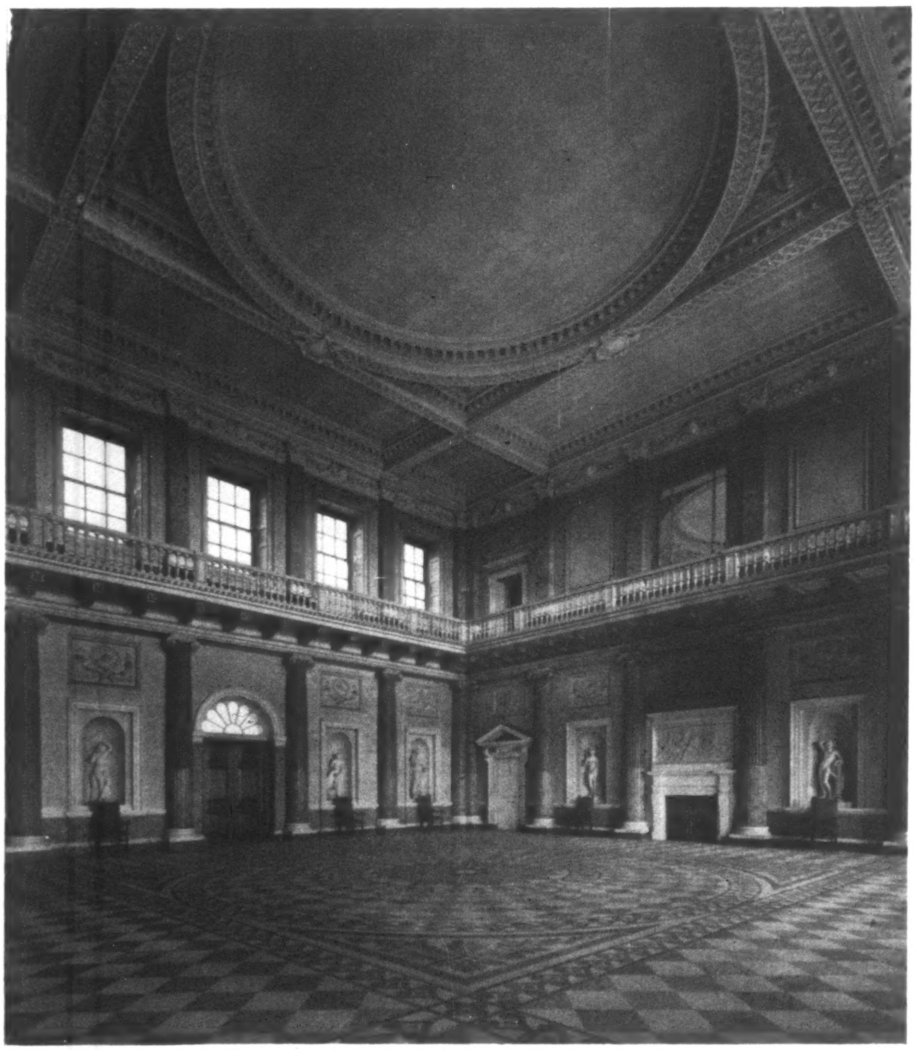
Palladianism, under the aegis of Lord Burlington, flourished in the first half of the eighteenth century. The desire for things Italian, which included stucco and plaster work, resulted in an influx of Italian-workers into England. The plasterers are sometimes remembered by name—Altari, Bagutti, Varssali, Cortese . . . but the details of their lives are forgotten; the majority remain anonymous. They were not all mere stuccoists: some specialized in scagliola.

At one time a jealously guarded secret, scagliola is basically a fine plaster with additives—sometimes glue, albumen, even curdled milk, according to the particular theories of the craftsman, and, of course, colouring matter—which is planed and highly polished so that it looks like and is often indistinguishable from real marble.

Scagliola was introduced into this country—so it is said—by the architect James Wyatt, at the Pantheon, Oxford Street, in 1772. In fact, it was used by other architects before that date: just one illustration is Thoresby Park, in Nottinghamshire. The mansion, a seat of the Duke of Kingston, was designed by John Carr, of York, and finished in 1768. The Reverend William Bray, itinerant writer of 'A Tour into Derbyshire and Yorkshire,' was sufficiently impressed by the house to give a description in which he mentioned the scagliola. Of the central circular hall, he said 'The sides of this room are of the same composition as is used in the hall in Lord Rockingham's, resembling a yellow marble; on the sides are pillars and pilasters, mostly white but some resembling verd antique. The floor is of the same composition.' Alas, the mansion and building records have long since gone.

Fortunately, the muniments of Wentworth Woodhouse, former home of the Marquis of Rockingham, remain, and there, among the vast accumulation of documents, is a letter from John Carr, the architect, in which he mentions that the scagliola work at Thoresby Park was done by a Charles Clerici, assisted by Ely Crabtree, who later set up as a plasterer in Lendal, York. From the same muniments it has been possible to enlarge a little on the life of this hitherto unknown craftsman.

The year after the completion of Thoresby Park, Clerici appeared at the town house of the Marquis of Rockingham, in Grosvenor Square, where for a while he worked—and lived, since his bills for washing, liquor, the shoemaker and tailor



The Grand Saloon at Wentworth Woodhouse, with scagliola work by Clerici.

were all paid by the steward. In 1774, he again transferred to the Marquis's country seat at Wentworth Woodhouse, Yorkshire, where he had been in the 1760s, and there remained for many years, still working under Carr's direction.

His pay was a guinea a week in addition to his board and lodging—not bad remuneration when one considers that the steward, a man of considerable responsibility, received only £50 a year.

Arthur Young, the agriculturalist, visiting Wentworth Woodhouse, remarked that 'the most skilful hands from Italy are kept constantly employed in finishing this noble design.' He exaggerated, unless he referred only to Clerici's two hands, for no other Italians figure in any of the accounts.

Clerici did a variety of jobs: he made casts, pedestals, scagliola tables and put vine leaf insets in marble chimney pieces, but his principal work was in the Grand Saloon, illustrated on page 356. The niches, the eighteen fluted Ionic columns beneath the gallery, the eighteen Corinthian pilasters to the gallery, and the fine 'marble' floor, designed by Carr, are his epitaph: they are superb.

Clerici must often have wondered whether his time had been well spent whilst working in the great shell of a country house for the pleasure of one nobleman. But in 1789, seven years after he had left, the Saloon was really used in the manner which its scale justified. The occasion was the visit of the Prince of Wales. The park was crowded with 20,000 rejoicing subjects. Inside, a brilliant assembly thronged the Saloon and, lit by a vast chandelier of 200 tapers and festoons of 8,250 lamps, the work of Charles Clerici was there for all to admire.

Clerici's stay at Wentworth Woodhouse was fairly uneventful, except for the time when he put a maidservant in the family way. A curious situation then developed. Clerici, apparently, retired into the background and left the senior members of the household to worry—not over the girl's plight—but over what was to become of the yet unborn child: an infant at Wentworth Woodhouse would be highly inconvenient. They need not have concerned themselves: the young woman died—to their obvious relief.

For the rest, Clerici lived quietly: he was treated with respect and addressed as 'Mr.'; when he was sick, a woman was engaged at 6d. a day, to look after him and, very occasionally, small payments were made to him by the steward . . . for tea and sugar. Then, in August, 1782, his work finished, Clerici drew the whole of his salary for eight years 259 days—£475 10s. 10d.—and disappeared again into oblivion.

Robert Brian Wragg

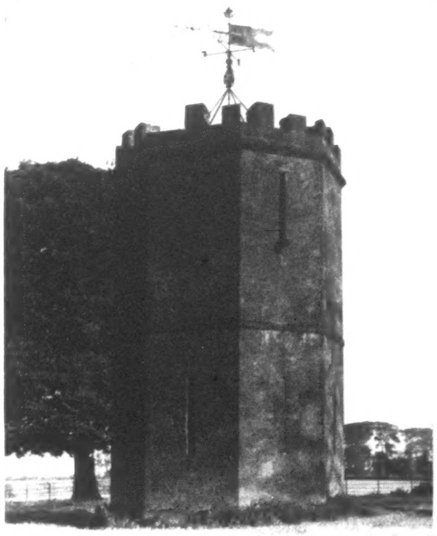
FUNCTIONAL TRADITION

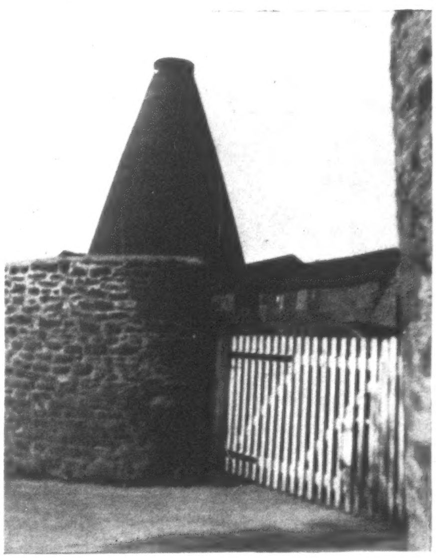
THE FUNCTIONAL FOLLY

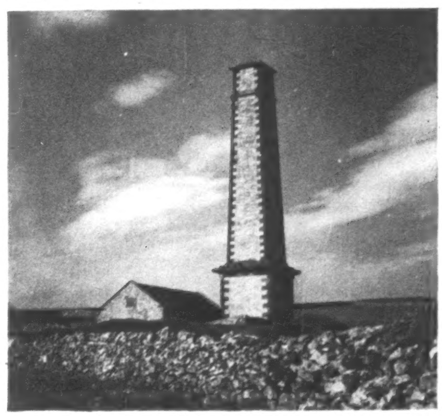
The Concise Oxford Dictionary *defines a folly as 'a costly structure (considered) useless.'* The definition has the advantage of conciseness, no doubt; but what led to the erection of nine out of ten of the buildings that are normally known as follies? Nothing else, surely, but the need to supply the landscape with a vertical feature in a particular spot.

Accept this definition—which isn't really affected by the fact that many follies were designed to have romantic overtones as well—and you arrive at the conclusion that the 'uselessness' of follies for 'practical purposes' is beside the point; and indeed most eighteenth-century follies did serve some practical purpose, though that was of less importance than the aesthetic one. Buildings put up for utilitarian reasons may in terms of landscape be follies—in short, thus there are such things as functional follies. This is a truth of great pregnancy for us today; but before we turn to that let us examine a small collection of follies, functional and otherwise.

1 is at Wroxton, Oxfordshire, and dates from the middle of the eighteenth century; 2 stands on the edge of the Cotswolds, overlooking Broadway and the Vale of Evesham, and was built some fifty years later. No one, presumably, would deny the term 'folly' to either of these. With 4 we have our first functional folly, the chimney of a Derby-







1 | 2
3 | 4
  | 5

1, *Wroxton, Oxfordshire.*
2, *Broadway.*
3, *Bridgwater, Somerset.*
4, *near Ashbourne, Derbyshire.*
5, *Stoke-on-Trent.*

6


7


8


9


6, *Alton, Derbyshire.* 7, *Dovercourt, near Harwich.* 8, *Portreath.* 9, *Burnham.*

shire mine. To make the strongest possible impact upon the eye a folly should have a certain strangeness of form, and this is what puts the kilns of the Potteries, three different varieties of which are seen (at Stoke-on-Trent) in 5, high up in the ranks of follydom; 3 shows a kiln folly of yet another shape, at Bridgwater in Somerset. Here it should be remarked that although the folly has been referred to as a landscape feature it is one of the many landscape features which have their place in townscape too; the lock-up at Alton, Derbyshire, 6, is an eighteenth-century functional folly in a village setting, and the tower at Harwich is a nineteenth-century one in a town. The last mentioned might also be counted among the functional follies of the coast, a large class whose practical function comes very close to their visual function as follies, it being their business to be seen or to provide elevated places for seeing from—or more often both at once. 8, from Portreath, shows a charming early example of this class, 9 and 7 later ones at Burnham and Dovercourt (near Harwich) respectively.

10, *Harwich.*

The importance of our discovery of the functional folly should by now be obvious; it is simply this, that in times when the means of erecting follies in the old sense are lacking we really have no need to do so: there are scores of utilitarian structures which can do everything the non-functional folly of the eighteenth century did. Only of course they must be properly sited; and so we come back once more to the necessity of establishing the same kind of visual control over our *whole* surroundings as the Georgian landowner had over his relatively narrow acres.

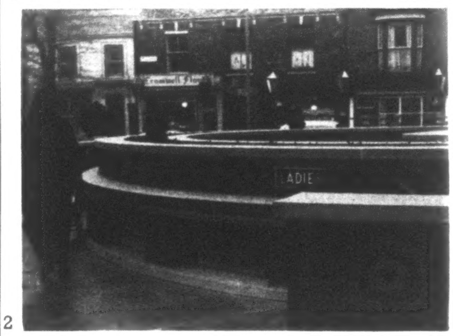
Marcus Whiffen

COUNTER-ATTACK

GRIMSBY, LINCS.

There used to be a small open space immediately west of the centre of Grimsby called the Bull Ring. For some time it was used as a car park and at least saved a few cars from adding to the congestion. Or it might have made a pleasant little space for pausing in shopping. However, when the public lavatories in the Old Market Place were pulled down, the Borough Council decided that they would find a good new home in the Bull Ring. The only question was: should they be built above ground and so save money or underground and so save space? After much debate, the space-saving plan was adopted, and digging began. Things didn't quite run smoothly, but eventually the work was completed: only, somehow they weren't quite as underground as expected; and with all the money spent on expensive excavation, they stick up about three feet

1


2


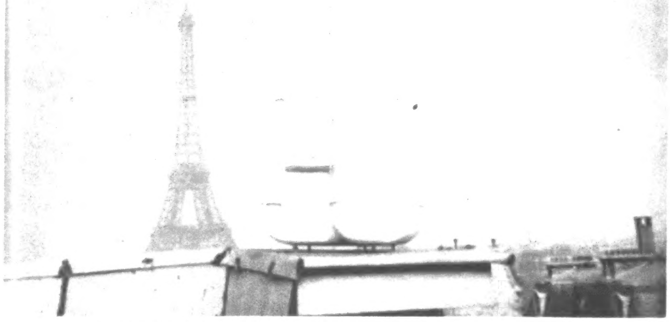
above the pavement level, 1. The space is destroyed as effectively as if they had been built to full height. Presumably as a bit of face-saving, the builders or the Council have given the top a bit of fancy stone-work, and even planted shrubs, 2. The whole little square has been sent packing.

THE RIVER ROE, CO. DERRY, N. IRELAND

Between Dungiven and Limavady there used to be a most beautiful stretch of the River Roe. Its banks were covered with fine trees. Now the trees are down, after some smart eyewash out of Belfast had bullied the local farmers into saying yes. The ostensible reason was that new floodbanks should be built; the real one perhaps to find some new way of coping with a bit of the unemployment problem. Unfortunately the Belfast people don't seem to have realized that the trees were there for a reason. Three main results can be expected from this little bit of ignorant interference. Firstly (in time), a beautiful stretch of the river has been made commonplace. Secondly, in a few years time the river, which was rich in salmon, will be more or less empty: the river will be overfished (as the fish will be easy to catch), and there are now no shady places which the salmon need for spawning. Thirdly, not very long hence the new floodbanks will have to be replaced, because there are now no longer any big roots to hold them in place. All this: and yet all that was needed was the repair of the old banks.

Andor Gomme

SKILL



1. two structural principles and two techniques are at once contrasted in this Parisian rooftop view—the flowing shell structure of the model of a mobile hotel unit, seen also in 10, with the graduated build-up of linear struts in the Eiffel Tower and the predetermined, factory produced connections of the plastic mouldings with the butchered, site fitted, flashings of the Mansard roof. Both aspects need to be considered when designing with polyester fibreglass.

POLYESTER FIBREGLASS *by*

Michael Brawne

It is as a corrugated rooflight that polyester fibreglass has so far made its greatest impact in building. This, however, hardly begins to explore the architectural possibilities inherent in this plastic which, like reinforced concrete, is the combination of two complementary materials: polyester resin and glass fibre reinforcement. Its great potential may in fact lie in its ability to be formed into complex, three-dimensional structures. This article therefore emphasizes the method of manufacture and the characteristics of the material and does not attempt to provide an exhaustive listing of current uses.

Polyester fibreglass has, more than any other plastic, caught the architectural imagination. It has done so presumably since it alone amongst the plastics can at present produce a structural and space enclosing element. The small-scale uses of polyester fibreglass are far from insignificant, yet it is its specific ability to produce a moulded three-dimensional enclosure which is of special interest and which may in fact be indicative of both a new technology and a new aesthetic.

Polyester resin is chemically a co-polymer of the esters. These are produced by the reaction of organic acids and alcohol and are very similar to the alkyds used in paint. Polymerization involves the arrangement of the molecular structure of a material so that it will acquire certain known and previously determined properties. It is this 'manhandling' of the chemistry which is perhaps the most important technological innovation of the post-war years and which is in the very near future likely to produce a whole series of new materials. The polyesters belong to the thermosetting group of plastics; they do not, that is to say, return to their original state when heated. They 'set,' become rigid, on being mixed with a catalyst, normally a peroxide, and an accelerator. These start a chemical reaction in which heat is given off.

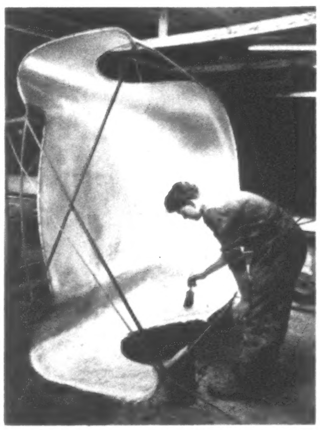
In order that this resinous material may be reinforced, in particular for it to acquire tensile strength, glass fibre is added while the resin is still liquid. The glass fibre may take a number of forms:

(*a*) it may be a loose mass of chopped strands which, as the fibres are short and in random directions, has relatively low tensile strength but equal strength in all directions;

(*b*) it may be a loosely combined mat of fibres in which the fibres lie in random directions and which has tensile strength greater than that of chopped strands, or

(*c*) it may be fabric—cloth woven in a number of weaves—where the threads are spun glass fibre; this has the greatest tensile strength due to the known orderly and continuous arrangement of the reinforcing material but is also its most expensive form.

The characteristics of the material which have furthered its use in building are its ability to be made into a weather-resistant structural element of varying degrees of opaqueness and variety of colour. Its considerable strength, equal or greater than that of aluminium, is almost entirely due to the glass reinforcement. Other materials can of course be used to give strength—cotton fabric, asbestos, expanded metal—but few seem to be as useful as the various forms of glass fibre. It is also of course only with glass reinforcing that highly translucent products can be made; light transmission can be as great as 85 per cent. The selection of the appropriate type

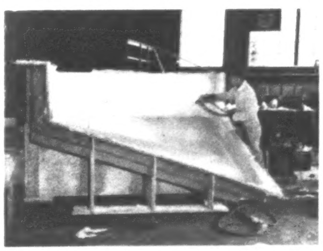


2. a glass fibre mat which will form part of a car body is being impregnated with resin.

of glass fibre is therefore particularly important. Its influence on the characteristics of the material is summarized in Table 1.

Whichever type is selected, it must, if it is to be used out-of-doors or in hot humid conditions, be made of alkali-free filament. This is the more expensive version and specifications of fibreglass products should make it clear which kind is being used. In addition to this the filaments ought to be treated with a silane emulsion so that the glass fibres bond with the polyester resin. Weathering depends on this key.

The weathering is also dependent on a definite thickness of resin lying on the finished surface of the product. Very thin mats of fibreglass are produced which are used as a kind of finishing coat and which absorb and hold the resin. These should certainly be specified in any component used



3. the same process as in 2 but mechanized; compressed air sprays the resin on to the glass cloth reinforcing.

externally. In extremely sulphurous atmospheres there may still be a leaching out of the resin and the suggestion has been made that for such situations polyester fibreglass could be coated with a layer of p.v.c. or acrylic.

The greatest drawbacks to the use of fibreglass reinforced plastic are its price and fire resistance. Both resin and glass fibre are products needing considerable manufacturing resources. There are three producers of glass fibre in this country, two of whom are in fact only nominally in the field, and there are about five chemical firms marketing polyester resins. Their prices are to quite a large extent dependent on their capacity and the likely demand. Labour costs on the finished component are also often high since few building elements, with the possible exception of corrugated roofing sheets, have yet been produced under a fully mechanized system. The price may, however, be lowered with greater demand; in the USA, for example, where there is a larger market and rather greater competition between the producers of the raw materials, fibreglass articles are often considerably cheaper than in this country.

Fire resistance is perhaps the more serious problem. It is possible to add chemicals to the resin which will make the laminate self-extinguishing; it will only burn while in contact with a flame. It is interesting that despite this relatively poor fire resistance, a glass fibre reinforced plastic was used for the casing of some capsules shot into outer space and recovered after re-entry. It would seem that what in fact happened was that during the short intense exposure, the surface carbonized and this new layer provided

table 1: strength of polyester fibreglass and aluminium

	rod with uni-directional rovings	plain weave cloth laminate	chopped strand moulding	aluminium
tensile strength 1,000 p.s.i.	120	38	26	10-35
compressive strength 1,000 p.s.i.	70	30	25	10-15
flexural strength 1,000 p.s.i.	150	48	32	10-25
impact strength (edge unnotched) ft-lb/in.	70	22	20	20

a kind of protective coating. It was able to do so because of the very low thermal conductivity of the material, about one seven hundredth that of aluminium. Some recent tests on corrugated roof lights have apparently shown very similar results.

The important weakness of the self-extinguishing additive is, however, that it may considerably lower weather resistance and be responsible for discoloration. There is also, in any case, appreciable loss of the self-extinguishing effect after prolonged exposure and the LCC, for example, makes no distinction between the two grades. It would seem that, at present at any rate, the self-extinguishing form should only be used internally, away from ultra-violet radiation, in places where it is likely to come into contact with cigarettes, an electrical short circuit or similar hazard.

Until very recently polyester fibreglass products were made more often by amateur and professional enthusiasts in disused garages than as part of a co-ordinated industrial process. This was due to the fact

4, these bus components are economical in polyester fibreglass since the number required is relatively small and the shapes complex.

that the simplest method of manufacture, the hand lay-up process, requires little capital and hardly any equipment since no pressure is needed to produce a moulding. This basic process consists of a few simple stages: a form of plaster or wood is coated with a parting compound (in the same way that shuttering is oiled), the resin is mixed with the accelerator to start the chemical reaction going, pigment and filler may also be added at this stage, some of this glutinous mass is then spread over the mould and the reinforcing material added. Further layers of reinforcing and resin are built up until the right thickness is achieved. The material then cures at room temperature. The resultant product is a hard tough shell, smooth on the mould side, rough on the other.

Various attempts have been made to mechanize this particular process. Instead of placing the resin by hand it can be sprayed on and equipment has been used in which polyester is sprayed from one nozzle, the accelerator from another and they combine to react chemically on the reinforcing. In addition to this, chopped-up strands of glass fibre may be blown on by a third nozzle so that the three components of the

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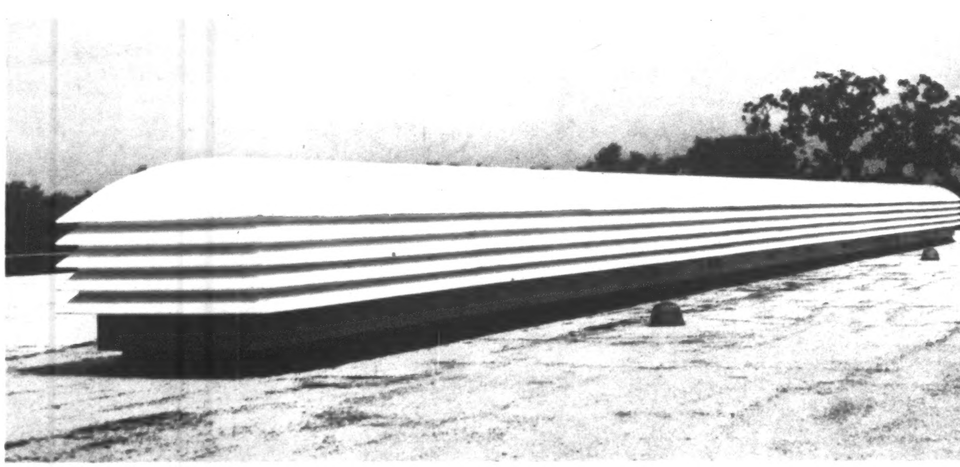

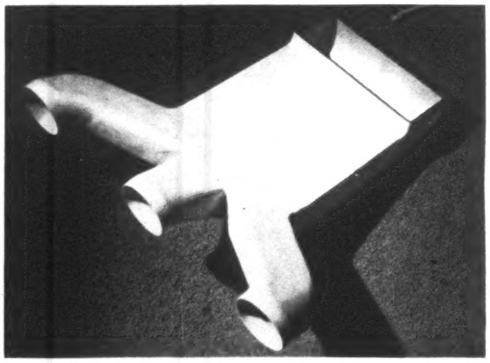

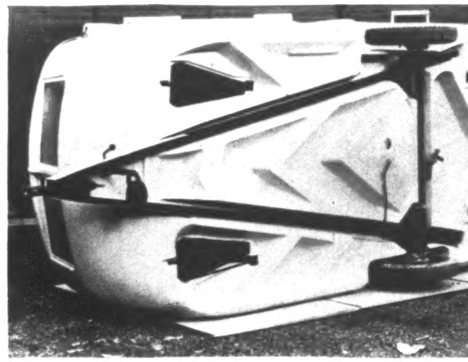

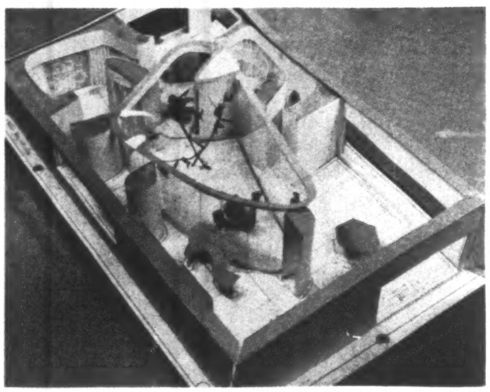

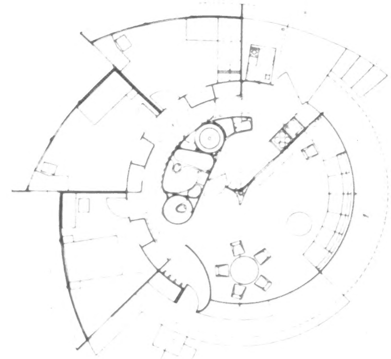

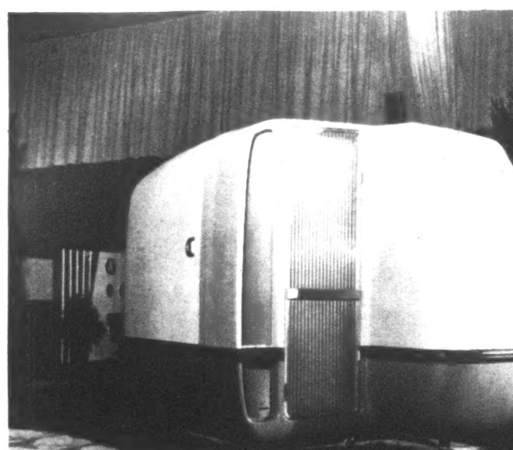

5	
6	7
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	10

5, a moulded roof top monitor at the Monsanto laboratories in St. Louis which is not attacked by corrosive chemical fumes.

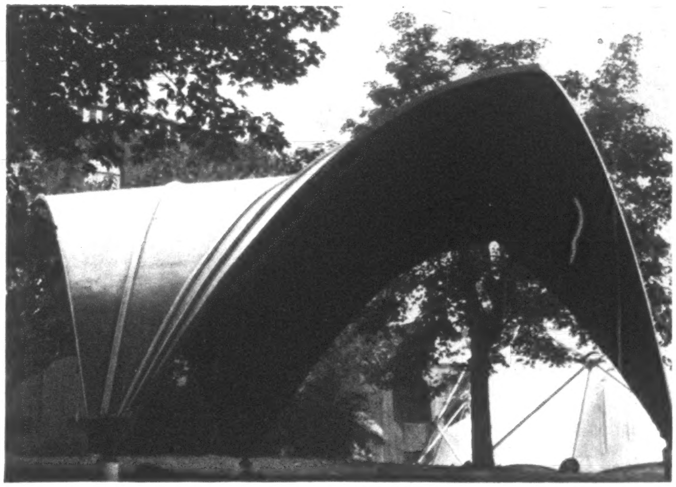
6, surface continuity and smooth flow can be achieved in quite intricate forms such as this ducting of the Viscount 800.

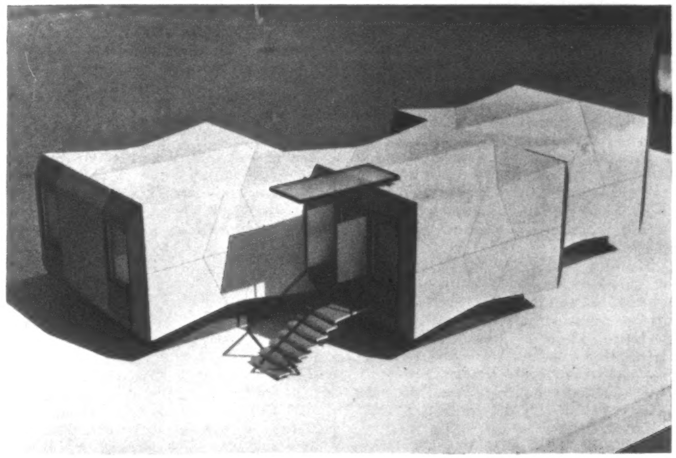
7, the underside of a caravan chassis designed to contain the wheels and metal legs and which achieves rigidity through the depth necessary to house these parts.

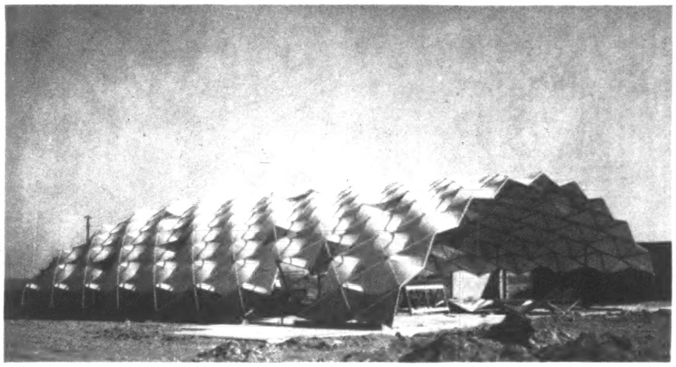
8, House '1980' at the 1956 Ideal Home Exhibition by Alison and Peter Smithson was made of fibrous plaster but clearly illustrates the aesthetic of reinforced plastics.

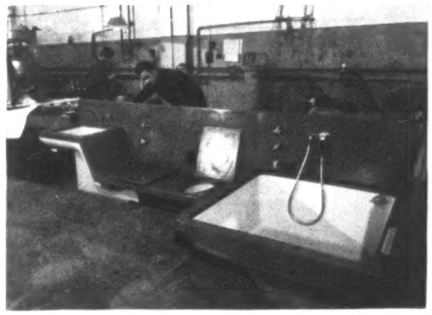
9, a spiral house designed by Coulon, Magnant and Schein for the French magazine 'Elle' in 1956. It exhibits, particularly in the bathroom area, many of the forms also found in the Smithsons' house of the same year. These shapes are made possible by the simplicity of the hand lay-up process.

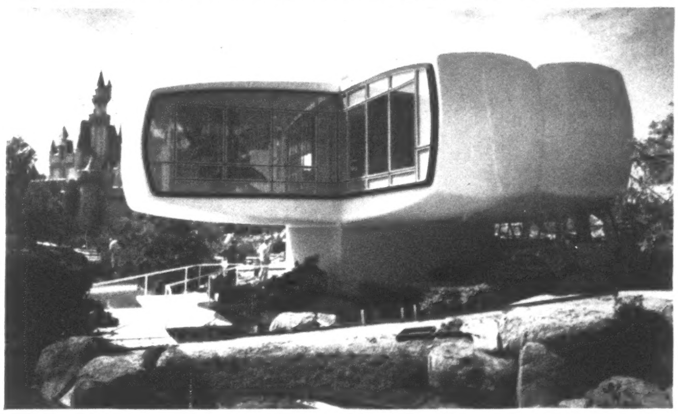
10, a prototype hotel cabin also by Coulon, Magnant and Schein which was part of a study sponsored by the French Hotel Federation. The cabin consists of two upper and two lower moulds and includes a bathroom in the bulge to the right of the door. Four cabins can be loaded on to an articulated trailer.

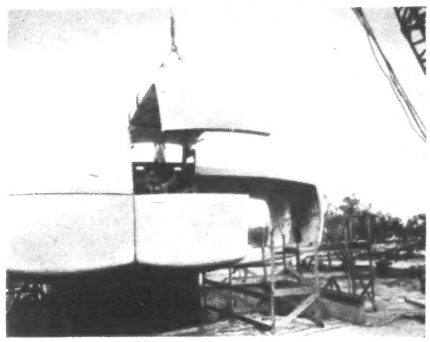


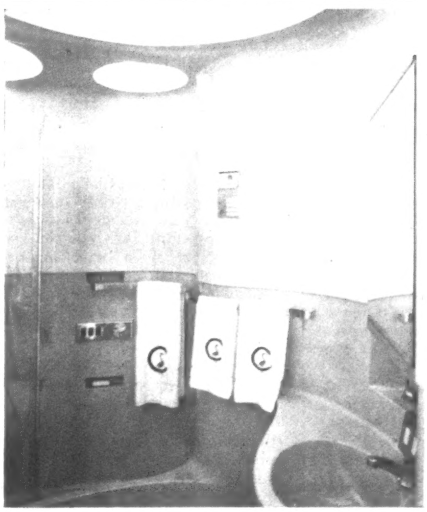












11 | 12
13 | 14
15 | 16
17

11, three joined shells at the 1957 Triennale by Robert Menghi built up from polyester fibreglass skins on a honeycomb core.
12, prefabricated fibreglass house units designed by Cesare Pea. The faceted wall units which include heating elements are also intended as cladding for multi-storey buildings. These units have something of the character of Howell and Killick's project for Churchill College.
13, diamond shaped polyester fibreglass hyperbolic paraboloids used with a tubular frame for a factory in Texas.
14, a complete bathroom unit of polyester fibreglass mouldings with plumbing connections installed in the factory. It was designed by Alberto Roselli and is a development (in metal) of the ideas of Buckminster Fuller.

15, the Monsanto 'House of the Future' is, despite its Disneyland setting, a serious study in the large scale use of plastics. It was developed by Marvin Goody and Richard Hamilton with H. P. Whittier, of Monsanto, as part of a project at M.I.T.
16, the structure of the Monsanto House consists of eight shells cantilevered from a central square core of four columns tied at top and bottom. Each L-shaped form is built up from two separate sandwich-construction shells; both have two skins of polyester fibreglass, the outer with an isocyanate foam core, the inner with a 3-inch-deep honeycomb core for the ceiling and a 4-inch-deep honeycomb core for the floor. The shells were made by the hand lay-up method and formed with a vacuum bag.
17, the bathrooms of the Monsanto House were designed by Henry Dreyfuss. Except for the w.c. pan the entire bathroom consists of two polyester fibreglass moulds which join about shoulder height. Radiant heating panels are attached to the back surface of some of the walls.

continued from page 360]

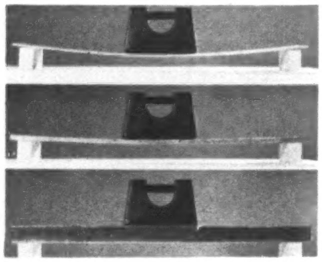
material arrive simultaneously on the prepared mould. While this is an obviously rational method it has not as yet produced wholly satisfactory results in practice. It is very dependent on the skill of the operator and the smooth functioning of the equipment. Unfortunately a good deal of equipment has been modified for use with polyester fibreglass rather than designed with this specific problem in mind and it is probably not until new machinery comes on the market that this particular method will prove successful.

If two smooth surfaces are needed in the finished product, the polyester fibreglass has to be placed between two matched moulds and these brought together under pressure. As it is uneconomic for these moulds to remain idle while the resin cures, heat is also added during this stage so that the material will harden in a matter of seconds rather than hours. A typical process might consist of the manufacture of miners' helmets in which chopped strand is sucked on to a mould by a vacuum process in an enclosed booth, the shaped reinforcing is placed between the matched moulds, a mixture of resin

and accelerator is forced into the space between them and the two moulds brought together under heat and pressure. This method is a repetitive mechanized operation which needs a long run of production—perhaps a thousand parts—to pay for the heavy mould costs and capital outlay in equipment. Given such a long run, however, the cost of each item is significantly lower than if it were made by hand. Charles Eames's famous moulded chairs are, for example, produced by this method.

Simpler, less mechanized variations on this are the bag moulding techniques in which a flexible sheet is forced over a mould by suction or pressure. There is also a continuous lamination process where the material is shaped between rollers and it is this method which is used in any fully mechanized production of corrugated sheets.

Polyester fibreglass has also been extruded using roving (a bundle of



18, *the rigidity of a panel can be greatly increased by introducing a foamed core between two skins of polyester fibreglass. Each of the three panels has the same self-weight and the same superimposed load.*

continuous glass strands) which has very great strength—in tension twice that of structural steel—due to the one directional orientation of the filaments. At the moment, however, it is only possible to extrude very small sections up to a diameter of ⅝ in. which are used mostly for fishing rods and aerial supports. The suggestion has been made though, that in view of its great strength it may be a suitable material for prestressed construction. When the technical problems of extruding are overcome, a whole new range of products with very great possibilities is likely to become available. This is particularly true since extrusions can be designed as very complex shapes which make possible difficult connections and which are also able to distribute the material so as to create structurally economical sections. As these extrusions are likely to be stronger than comparable sections in aluminium, they may prove yet another serious competition to the use of aluminium in building.

Flat sheets pose, of course, much less of a problem. The reinforcing can be coated by rollers and the mould costs, two flat plates, are very much lower. It is nevertheless in a curved or faceted form that polyester fibreglass finds its most logical use, both in terms of strength and economy. Whether ease of production under present techniques or versatility and economy in use will determine the trend in the manufacture of polyester fibreglass may, to a large extent, depend on the design of the right equipment at this time. The choice between these alternatives may also have some architectural repercussions.

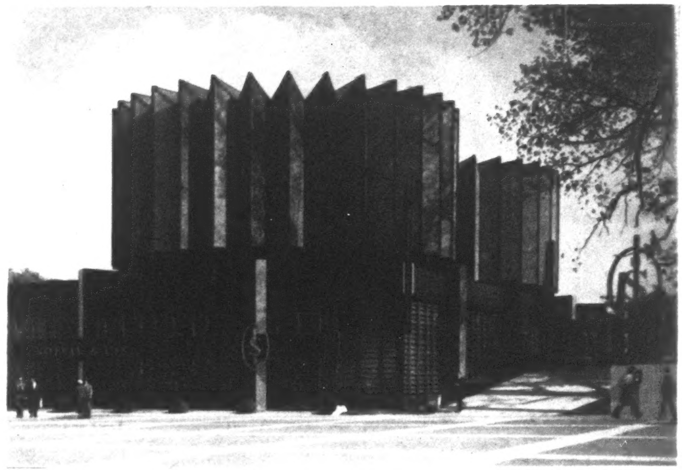
In the last three or four years there has been a noticeable trend towards the design of continuous and often curved surfaces. This is undoubtedly partly a reaction to the linear, frame and infill structures of the previous decade, but is perhaps also a forecast of the shapes likely in a building technique largely dependent on the use of plastics. The interest which is being shown in the architecture of the Aegean islands or that of the Sahara fringe is probably equally symptomatic of this trend towards a moulded building. It is in some ways obviously comparable to the fascination which Japanese architecture exercises as a prototype for modular, frame and panel design. Often these sculptural forms have had to be built out of substitute materials and they are, therefore, important as spatial prototypes rather than as technical innovations.

The Smithsons' House of the Future displayed at the Ideal Home Exhibition three years ago, 8, has all the characteristics of a polyester fibreglass structure although it was actually made of fibrous plaster. Its continuous, often doubly curved surfaces with rounded corners could easily and economically be moulded out of glass fibre reinforced polyester. Additional strength and heat insulation could be given by using this over cores of foamed plastic or bonding it to paper or aluminium honeycomb. The thickness of this core, as of the fibreglass itself, can, of course, be varied depending on the strength required. Since the abrasion resistance of polyester is not very high (making it a questionable material for kitchen sink units), it may be advisable to give the structure an outer coating of melamine resin. Recent experiments have also shown the possibility of embedding 'Mohglas,' graphite coated glass cloth, as part of the laminate to create a heating element. Sections of the house could, therefore, contain radiant surfaces as part of the structure.

There have naturally been several projects in which polyester fibreglass elements were part of the structure. In 1956 René Coulon designed a spiral exhibition house, 9, in which the entire enclosure was fabricated out of segments laid up by hand on a plaster mould. More recently two Italian designs, one for a roof structure, 11, the other for wall components, 12, have studied the use of reinforced plastics. There have also been several schemes for complete bathroom units, 14, which obviously owe a good deal to the very much earlier 'Dymaxion' designs of R. Buckminster Fuller. Such complete units seem especially suitable, at this stage at any rate, for aircraft, trains and ships.

The most ambitious and widely publicized of these projects has been the 'House of the Future' designed by Marvin Goody and Richard Hamilton as part of a programme financed by the Monsanto Chemical Company in the States, 15, 16 and 17. Despite certain disappointing aspects of the design—especially its fenestration—this is the sort of exploratory study which is all too rare and which can really only take place if sponsored by industry or government. In the Monsanto House two identical doubly curved shells—one for the roof and half the wall, the other for the floor and remainder of the wall—are cantilevered from a central structural core. Eight pairs of these shells form the cruciform enclosure of the house.

It is perhaps outside these architectural prototypes that the most interesting developments are occurring and have been able to reach the production stage. Boats 56 feet long have been built as a single continuous structure and moulded caravan bodies are now common, 7.



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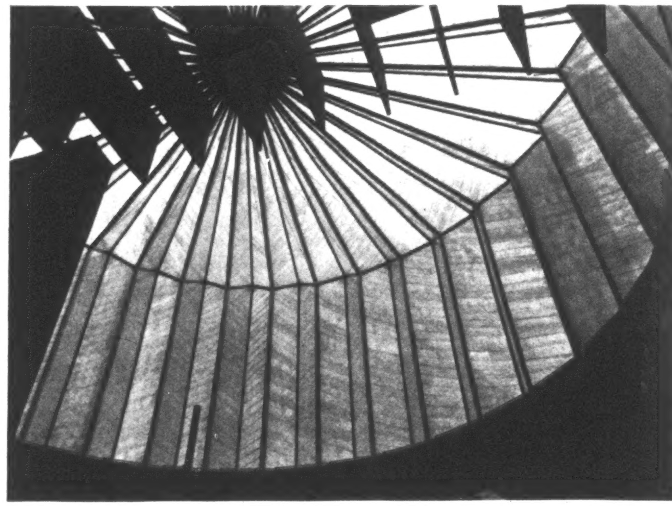

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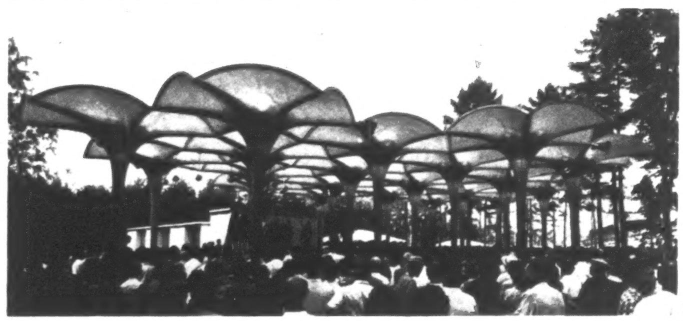
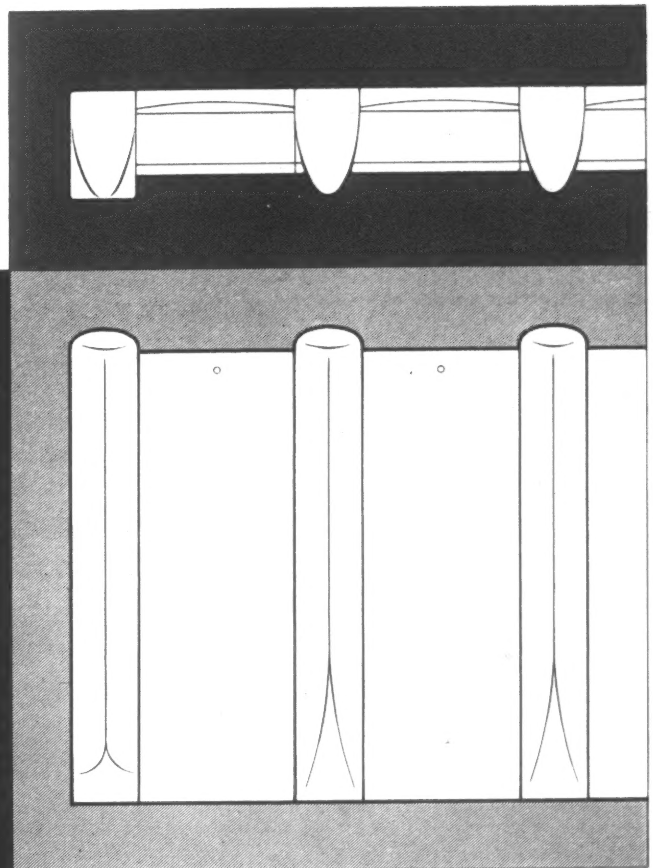


21

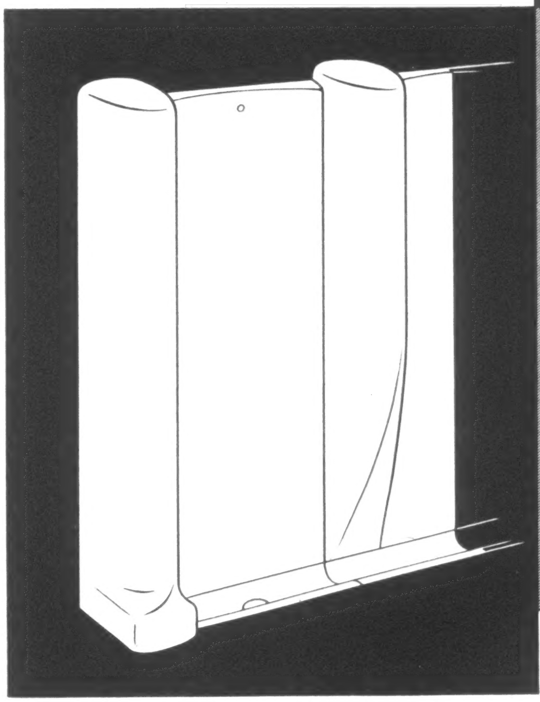
19, 20, *the two lanterns of the Solvay Company's pavilion at the 1958 Brussels Exposition were made of translucent and coloured polyester fibreglass panels with a honeycomb core.*
21, *translucent polyester fibreglass umbrellas designed for the American Exhibition in Moscow by George Nelson.*

The manufacture of car bodies, 2, is providing useful experience in the serial production of large components though at the moment these are more expensive than a comparable metal item mass produced. But the geodesic radar domes of the North American defence system are perhaps the most spectacular and vivid application of the material.

Whether the implications inherent in these domes or the Monsanto house will be pursued is, of course, very much open to question. It is, for example, possible that the aircraft industry which in this country is at the moment anxious to deploy its resources will turn to building. In that case its accumulated knowledge of skin structures would find a useful outlet in reinforced plastics. It is equally possible that the present use of polyester in a vast number of small articles—one catalogue lists over 90 separate categories—may prevent its quick development. It is also true that despite its great advantages—strength, colour, translucency, weather resistance, fabrication—it has some considerable weaknesses—fire resistance, abrasion, cost. The very fast rate of development in the chemical industry may, therefore, supersede polyester fibreglass by a more advantageous, a more 'universal' material before it has even been fully explored.



design



material

What architects and local authorities have been waiting for—a slab urinal made of vitreous china. The 'Standard' Vitural is non-absorbent right through, in its body material as well as its glaze. Neither will craze or deteriorate. The urinal is, therefore, always hygienic and odour-free. Clean simplicity of design and an alternative form without stall divisions are further advantages of the 'Standard' Vitural. For fine design in the right material, specify 'Standard' vitreous china.

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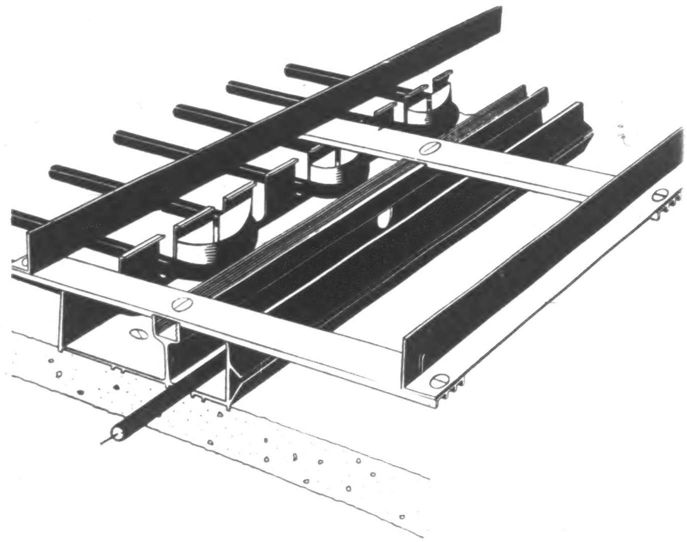
THE INDUSTRY

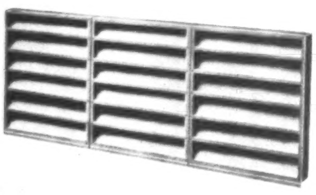


2, one of the working diagrams for the installation of Thermodare electric floor heating.

Fixed louvres

Greenwood-Airvac have put a new range of aluminium fixed louvres on to the market. The case for the aluminium as against the wood louvre is greater than it might appear, since the effective size for comparison is not the overall size of the louvre but the free area between blades and this for aluminium will be between 50 to 60 per cent of the overall size and for wood only about 33⅓ per cent. The Greenwood-Airvac range is composed of standard units of widths of 15 and 18 in. and heights of 12 in., 18 in. and 24 in. These units are all 2½ in. deep and can be bolted together in any combination. When this is done, the vertical joint is closed by a pair of pvc tubes, the horizontal joint by the turn down edge at the foot of each unit. Greenwood-Airvac prefer to assemble the units in their factory. The price of the three 15 in. by 18 in. units in the photograph is £6 15s., to which must be added a charge of about 10 per cent if shop assembly is required.

Greenwood and Airvac Ventilating Company Limited, Beacon House, Kingsway, London, W.C.2.



1, the Greenwood-Airvac aluminium louvre.

Thermodare

Embedded electric floor heating has become all the rage, before we know very much about it—as so often has happened in the history of technology. One of the unknowns is—whether or not the cables should be buried for all time or should be withdrawable in case of breakdown. Thermodare have now produced a withdrawable system of extruded aluminium trough sections which house the main distribution wires and accommodate the ends of element loops. When the troughing has been laid and elements looped into position a 'structure' of cross straps and angles is fixed to the top of the trough—the upstanding legs of the angles forming a stop to the floor screed. Into the space between these legs sits a metal frame with reinforcing bars which is filled with concrete and finally with the floor finish to form a cover—removable for inspection of the heating system. The company issues a good explanatory booklet with stage-by-stage pictures to demonstrate the installation procedure.

Thermodare (Great Britain), 94/98 Petty France, S.W.1.

Graceline

Edge finish has always been a problem with rigid plastic coverings to worktops and draining boards. One solution was the traditional thin hardwood strip; another to cover the edge with a strip of plastic, machined off flush with the top surface. But now it is possible to have rounded edges, down to radii of 1 inch for internal or external angles. The Formica people have developed a form of their material incorporating a plasticizer, which they claim not to affect the durability and heat-resisting qualities now familiar to us all.

A number of firms who make plastic covered equipment have seized on this—3 shows a unit made by Graceline Units Ltd. of West Drayton, which, with a stainless steel sink in size 21 in. by 63 in. costs £24 19s. 4 shows a cutaway detail of the edge. Presumably architects can have

[continued on page 366

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continued from page 364]

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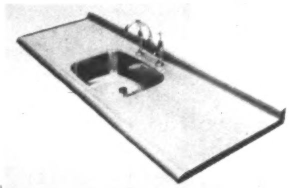

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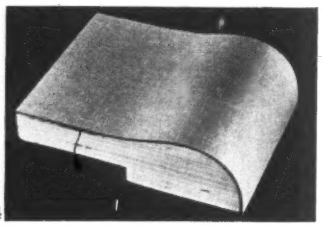


3, 4, general view and detail of sink unit with rounded, Formica-covered edges.

their own 'round edge' designs made up in the same way.
Graceline Units Ltd., West Drayton, Middlesex.

A good-looking domestic boiler

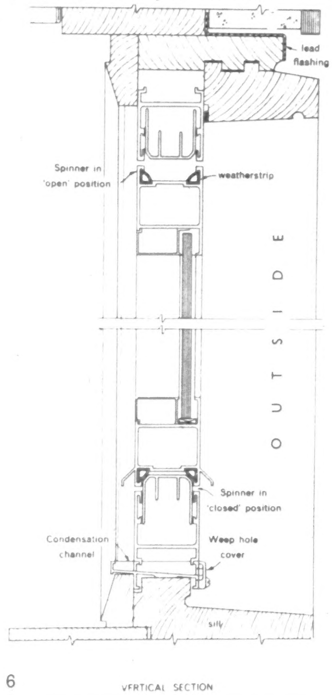
The illustration, 5, shows Neville Conder's casing for the Tayco Thermatic 25. This is a solid fuel domestic boiler with a rating of 25,000 Btu and is a little sister to the same firm's Super Thermatic which was put on the market about a year ago. It has a boiler which is described as 'quartic.' This means that it is square on plan top and bottom and circular on plan in the middle, a form which is reputed to be of special efficiency. The other point about it (apart from appearance, which is excellent) is that it has an enclosed shaker and deep ashpan which together cut down to a minimum the puff of ash caused by riddling. The stove can be got in

5, the Tayco Thermatic 25 boiler.

five colours as well as white and costs 24 guineas retail.
Robert Taylor and Company Limited, 170-172 Victoria Street, London, S.W.1.

The 'spinner' window

Williams and Williams, with their 'Spinner' window, have made a new contribution to the problem of cleaning windows in air-conditioned buildings. This is a horizontally pivot-hung aluminium window, designed normally for double glazing; but instead of closing on to the usual complicated system of reversed rebates, the pivoted light is designed to spin in the clear. When it is to be closed, a key is turned and four aluminium channels advance from behind the fixed frame and close against a pair of continuous neoprene weather strips. The advantage of this is, first, that when the window is closed, there is positive double seal

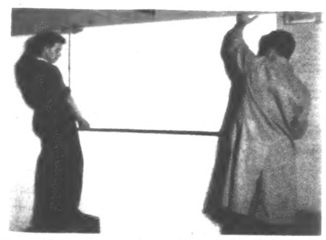


6

against the escape of conditioned air to the outside. Second, that the escape of air during cleaning is limited to the second or so which it takes to spin the window one through 360°. For once the window has been spun it may be locked, the former outside face may be cleaned and it may be left until the next time of cleaning—there is no need to spin it back again.
Williams and Williams Limited, High Holborn, London, W.C.1.

Prefabricated tile partitions

Pilkingtons Tiles Limited have brought into the market an interesting rival to the terrazzo partition. It is a ceramic tile partition, made up in panels of up to 6 ft. by 3 ft. in size and in thicknesses of 1¼ in. 1½ in. and 1¾ in. The two outer



7, a section of tiled partition being lifted into place.

surfaces can be made of any of the 22,000 standard glazed tiles on the maker's books and are joined together by ceramic spacer discs which leave a space between. The partitions are, therefore, relatively light for handling. When they are in position

[continued on page 368

MOISTOP

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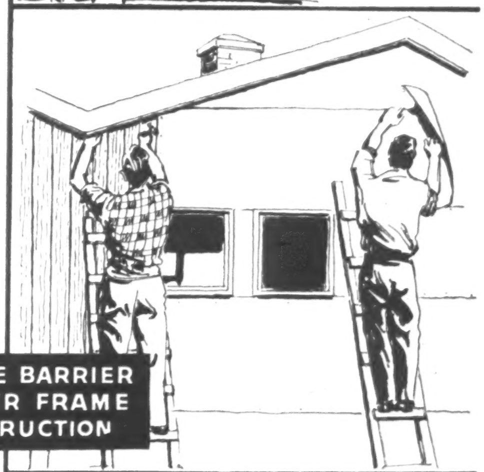

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- Form lining
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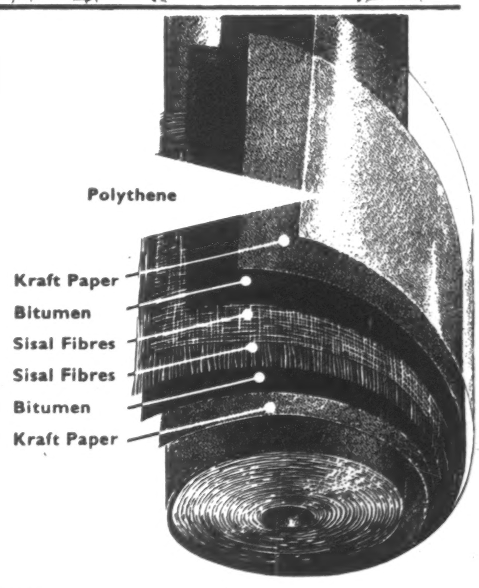

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continued from page 366]

the hollow core is filled with concrete. *Pilkingtons Tiles Limited, Clifton Junction, near Manchester.*

Anglo-Italian curtain wall alliance

The news that Crittall have come to an agreement with Curtisa SpA, of Bologna, concerning the exchange of experience on aluminium curtain walling is very welcome. Without going so far as to concede that Italian aluminium detailing is in all points preferable to our own, there is no doubt that the art of aluminium extrusion is more developed in Italy than over here. It is not only that the best Italian curtain walls are more sophisticated, but that they are in many points technically superior. Examples of these are the exploitation of the 'clip-on' section and the use of a more elaborate detail to avoid the 'cold bridge' effect. These little Italian triumphs in matters of technical detail are at first sight unexpected, as the Italian building industry as a whole is more dependent on craft as opposed to industrial techniques than ours. But we must remember that the North Italians had about a five years' start over us in the construction of tall buildings. We must remember also the fine metal work tradition which has always flourished in Bologna and Milan. In all events we congratulate Crittall on a most imaginative tie-up.
The Crittall Manufacturing Company Limited, Braintree, Essex.

CONTRACTORS etc

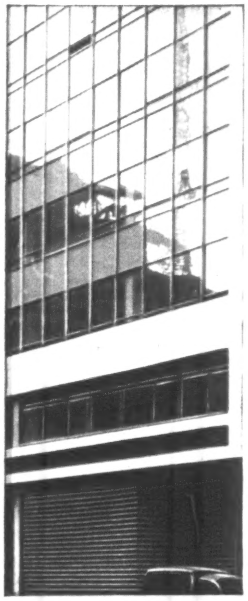
University Library, Sheffield. *Architects:* Gollins, Melvin, Ward & Partners. *General contractors:* W. J. Simms, Sons & Cooke. *Sub-contractors: Mechanical, heating and air conditioning:* G. N. Haden & Sons. *Air conditioning ducting:* Andrew Machine Co. *Library book-stacks and shelving:* Roneo Ltd. *Structural steelwork:* Thos. W. Ward Ltd. *Portland stone:* Bath & Portland Stone Firms Ltd. *Fire detection installation:* The Pyrene Co. *Lumenex ceilings:* Lumenated Ceilings Ltd. *Lifts:* Otis Elevator Co. *Metal windows, doors, ventilators and frames:* Mellowes & Co. *Glass lens rooflight:* Lenscrete Ltd. *Collapsible gates:* The Bolton Gate Co. *Paropa roof paving:* Frazzi Ltd. *Fibrous plaster and acoustic tile ceilings, fibrous plaster mullion casings:* Claridges (Putney) Ltd. *Terrazzo paving:* Hodkin & Jones Ltd. *Asphalt tanking:* Val de Travers Asphalte Ltd. *Asphalt paving and cork insulation:* Limmer & Trinidad Lake Asphalt Ltd. *Tier 4 suspended ceilings:* Sundeala Board Co. *Marble wall linings, facings and floorings:* Walter W. Jenkins & Co. *Danish panelling:* John Dale Ltd. *Balustrading and handrails:* Grundy Arnatt Ltd. *Sprayed asbestos columns:* Dicks Asbestos & Insulation Co. *Turnstiles:* Dixon Powner & Sons. *Hardwood block and strip flooring:* Acme Flooring & Paving Co. *Plywood panelling:* John P. White & Sons. *Counter and joinery fittings:* Simms Sons & Cooke. *Furniture, cloakroom and other fittings:* Conran Furniture. *Cork, p.v.c. and linoleum flooring:* Horsley Smith & Co. (Hayes). *Window blind gear:* W. J. Furse & Co. (London). *Travelling cradle and gear:* Palmers Travelling Cradle & Scaffold Co. *Double glazing units:* Pilkington Bros. *Main reading room ceiling:* Frenger Ceilings Ltd. *Facing bricks:* Richard Parton (Builders Merchants) Ltd. *Lamenated wood stair treads and landings:* Hordern-Richmond Ltd. *Sanitary fittings:* W. Emery & Co. *Timber doors:* F. Hills & Sons. *Extruded aluminium columns:* Northern Aluminium Co. *Steel gate:* Hobbs Hart & Co. *Partition blocks:* Thermalite Ltd. *Protection to Portland stone:* R.I.W. Protective Products Ltd. *Slate copings and cills:* John Fletcher Dixon Ltd. *Stainless steel ventilators:* J. R. Bramah & Co. *Ironmongery:* Smith Bros. & Widdowson Ltd. *Paint:* Jenson & Nicholson Ltd. *Clocks:* Gent & Co. *Electric light fittings:* Troughton & Young (Lighting) Ltd.; The Merchant Adventurers Ltd.; A.E.I. Lamp & Lighting Co. *Modular fittings, lowering gear:* London Electric Firm Ltd. *Curtains:* Liberty & Co.

Methodist Church, Mitcham. *Architects:* Edward D. Mills & Partners. *General contractors:* James Longley and Company. *Sub-contractors: Electrical:* Service Electric Company. *Flooring:* The Marley Tile Co.; Bennetts Wood Flooring (Tungit) Co. *Heating:* Advanced Heating & Air Conditioning Co. *Roofing:* Permanite Ltd.: Broderick Insulated Structures Ltd. *Structural steel:* R. O. Wright & Co. *Asbestos cement panel:* The Universal Asbestos Cement Manufacturing Co. *Bricks:* London Brick Company; Sussex & Dorking United Brick Companies. *Doors:* Thames Plywood Manufacturers Ltd.; John Sadd & Sons.; Esavian Limited. *Ironmongery:* A. J. Binns Limited. *Light fittings:* Rotaflex (Great Britain) Ltd.; Merchant Adventurers of London Ltd.; Frederick Thomas & Co.; A.E.I. Lighting Group. *Paint:* Hadfields (Merton) Limited. *Roller shutters:* Shutters Contractors Ltd. *Roof lights:* Williaam J. Cox Limited. *Sanitary fittings:* Stitsons Sanitary Fittings Ltd. *W.C. partitions:* William Mallinson & Sons. *York stone:* S. Marshall and Sons.

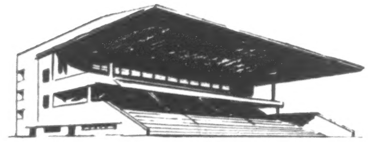
Roman Catholic Church, Lancaster. *Architect:* Tom Mellor. *General contractor:* The Warren Construction Co. *Sub-contractors: Steelwork:* The Bamber Bridge Steel Co. *Wood block floors:* Hollis Bros. *Pews:* Walmsley's Furniture & Joinery Ltd. *Special furniture:* F. L. Treasure; Hayes and Finch Limited. *Heating:* John Grundy Limited. *Electrical installation:* W. H. Inman Limited. *Copper roofing:* A. Higgingbotham and Sons.

Reconstructed Parish Church, Tolworth. *Architect:* Kenneth Wood. *General contractor:* Tom Porter & Son. *Sub-contractors: Bored pile foundations:* The Cementation Co. *Structural components and main arch:* Kingston (Architectural Craftsmen) Ltd. *Post-stressed lintol:* Cable Covers Ltd. *Roofing:* Permanite Ltd. *Flooring: Alufloor and resurfacing:* G. C. Constructional Flooring Co.; *wood block:* Horsley, Smith & Co.; *cork tiling:* Thames Flooring Co. *Heating:* Weatherfoil Heating Systems Ltd. *Electrical installation:* Davenant Electrical Co. *Lighting fittings:* Merchant Adventurers of London Ltd.; Philips Electrical Ltd. *Carpeting:* Heal & Son Ltd. *Mosaic:* Dennis M. Williams Ltd. *Door and window furniture:* Allgood Continental Ltd.; Arens Controls Ltd. *Paints and finishes:* Thos. Parsons & Sons Ltd.; Floor Treatments Ltd. *Signwriting:* Hastings Signs.

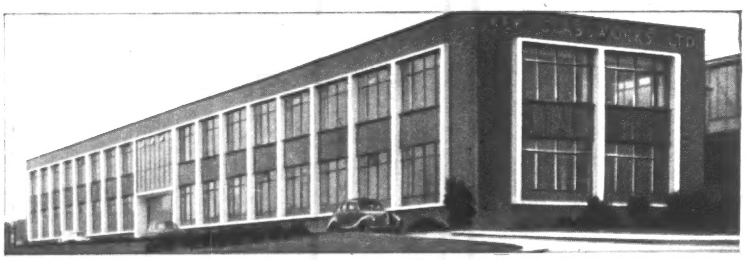
Flat in Eaton Square, London. *Contractors:* Ashby and Horner. *Loose furniture made by* F. E. Ward. *Soft furnishings by* Woolland Bros Limited. *Radio consultant:* Com. K. F. Paring (Period High Fidelity).



Office Block—High Holborn.
Architects George, Davies and Webb.



Nuffield Trust Hostel—Regents Park. Architect Eric S. Brown B.Sc., F.R.I.C.S.



Key Glass Works—Harlow, Essex. Architect Eric S. Brown B.Sc., F.R.I.C.S.

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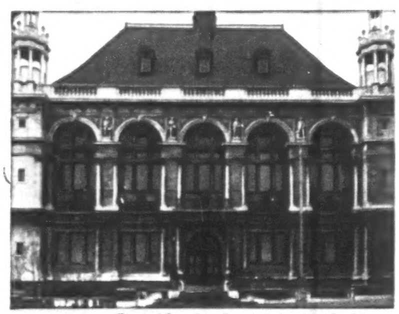
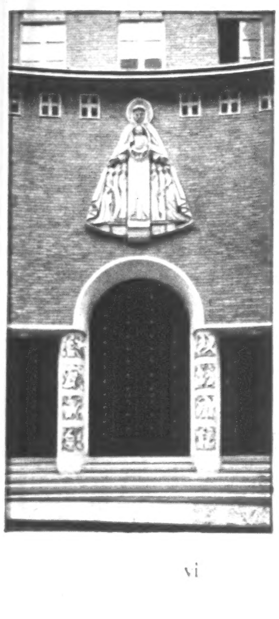


City of London Boys' School—Blackfriars.



Notre Dame Church—Leicester Square.
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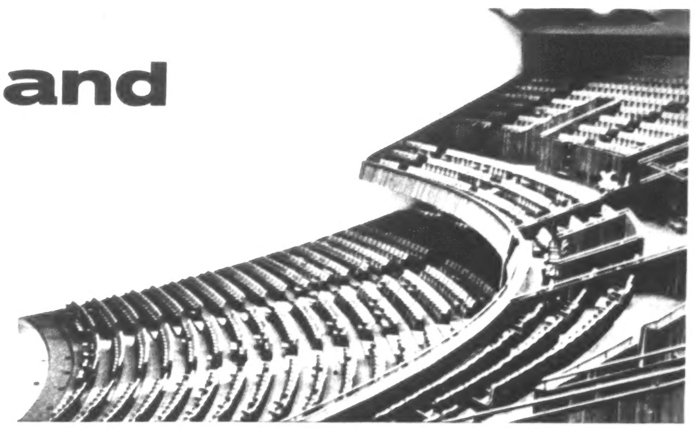

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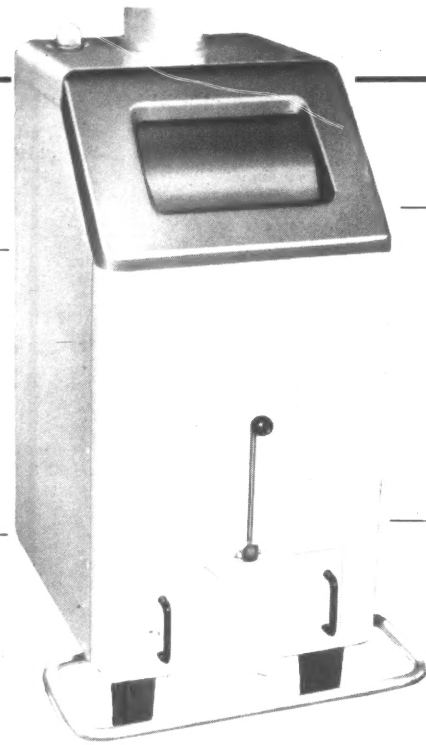

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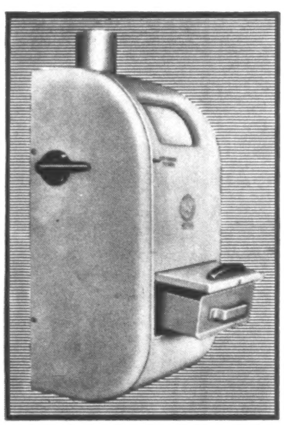

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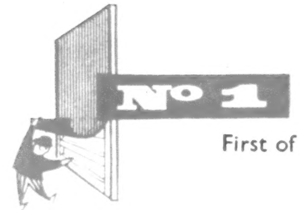

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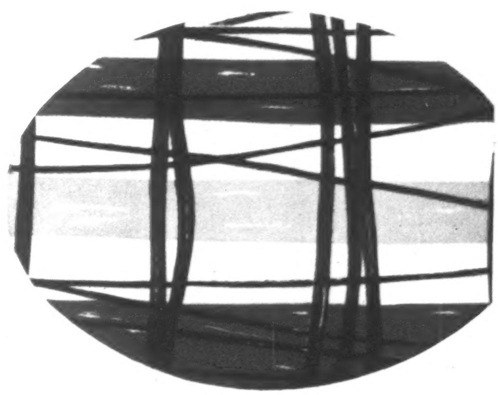

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Although these Boards are almost identical in strength characteristics and surface properties, we recommend WEYROC '34' particularly for the Building Trades. This is because it is available in the standard building board size and because it has a slightly higher impact resistance.

*

N.B. *These Boards are not suitable for suspended flooring.*

As Blue Label WEYROC has now been discontinued, this means that there is at present no WEYROC board for flooring. However, it is our intention to produce a new, special flooring grade in the very near future.

weyroc

one of the world's great man-made materials

WPS 70

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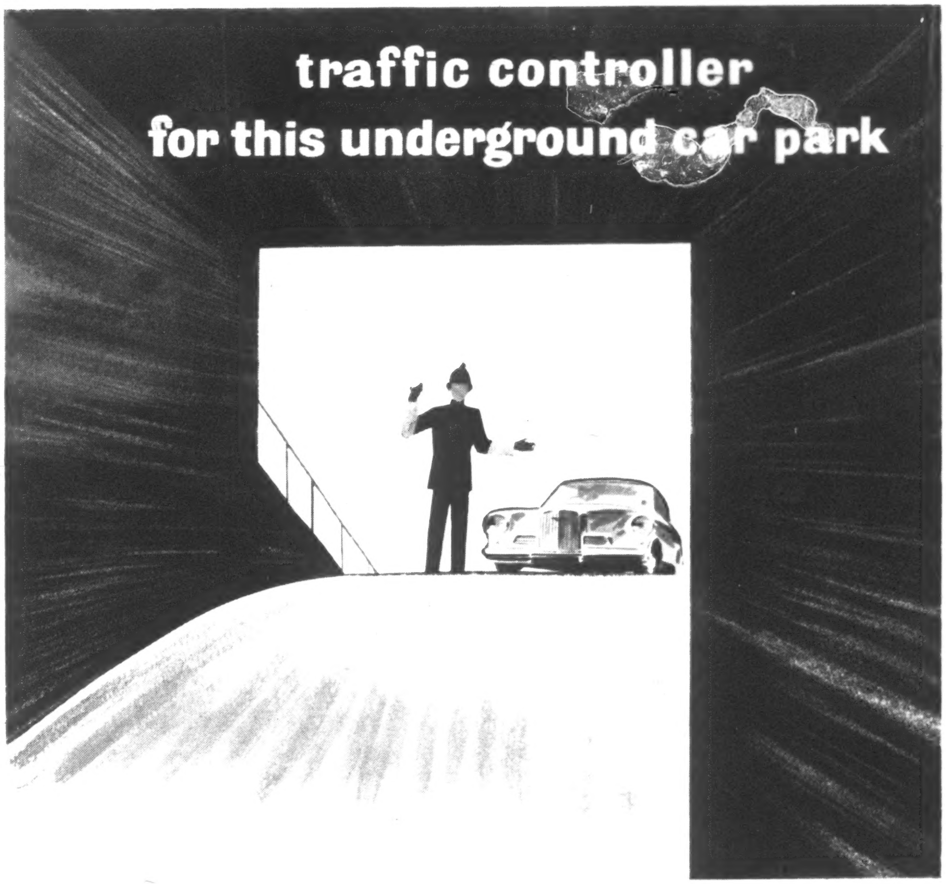
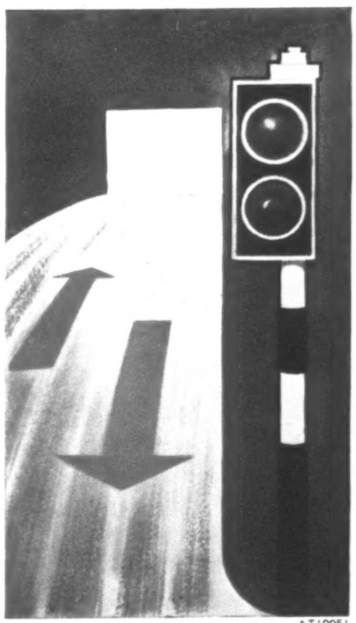


The increasing use of elevated and underground car parks, though solving the parking problem, sometimes creates problems of its own. Fortunately more and more authorities are realising that the ATE "Electro-matic" controller is the solution. This ingenious device acts as the driver's forward eye, enabling him to know exactly when to drive in or out — thus ensuring greater safety. The "Electro-matic" controller can just as easily control traffic in works precincts too, at level crossings, or at any point where private road or rail movements conflict; in fact, wherever there is traffic.



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Bath and panels made from blue 'Perspex' by Thermo Plastics Limited, Dunstable

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Coloured or white baths made from 'Perspex' are sold at prices everyone can afford. 'Perspex' is made in the standard sanitary ware colours as well as in a wonderful range of modern colours to suit modern tastes.

Be right up-to-date — sell baths made from 'Perspex', the best buy for the modern homemaker, builder, or architect.

MAKE SURE YOU STOCK BATHS MADE FROM 'PERSPEX'

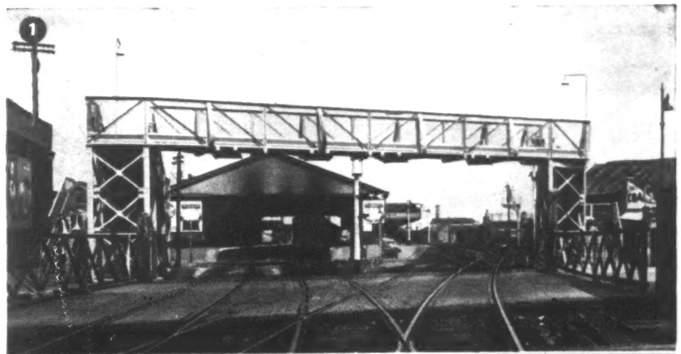
'Perspex' is the registered trade mark for the acrylic sheet manufactured by I.C.I.

IMPERIAL CHEMICAL INDUSTRIES LIMITED · LONDON S.W.1

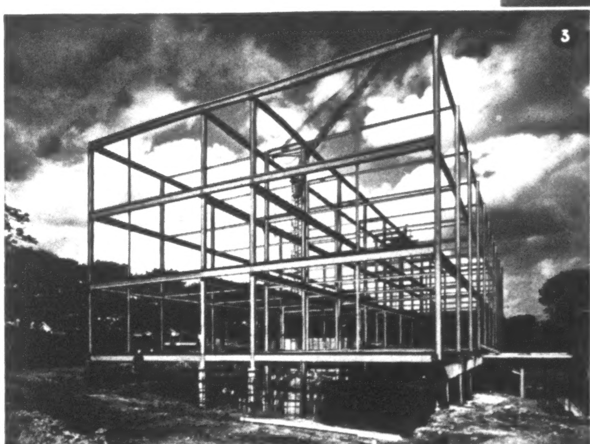
ICI

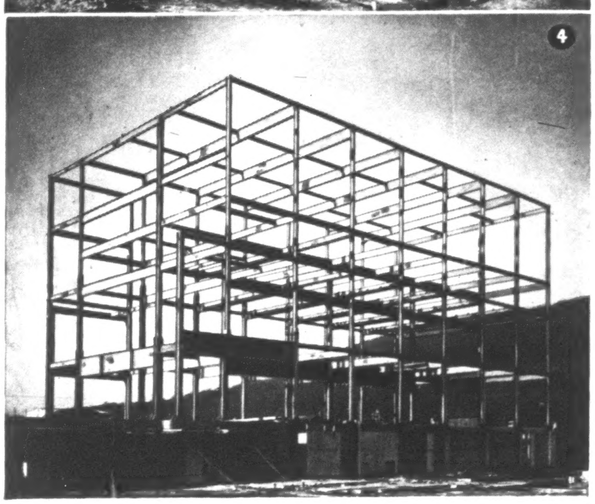
P.745

1. Footbridge for Level Crossing in Grimsby.
2. Interior view of factory for Messrs. Brook Motors Ltd., Barnsley.
3. Sowerby Bridge Secondary School.
4. Control Room, Services and Welfare Block, Elland Power Station.



STRUCTURAL STEELWORK





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H-P 5917

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ATLANTA

whatever size bath is needed

Whatever size a bathroom is to be, a Bilston Atlanta can be specified. Made in five sizes, the Atlanta has the superior Bilston finish and durability, plus design features that make it particularly safe and comfortable. No matter how large the estate, standard specification of the Bilston Atlanta ensures complete satisfaction The Atlanta has been selected for the Design Centre and costs no more than an ordinary bath.

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- Marina
- Mermaid
- Bermuda

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Flat Bottom—the Atlanta flat bottom helps to prevent slipping . . . ensures comfort. Particularly suitable where a shower is to be fitted.

Safety—the low sides make the Atlanta safer for young and old. It can be fitted to give an overall height of only 16".

Taps can be fitted centrally, or on either corner to facilitate installation and maintenance.

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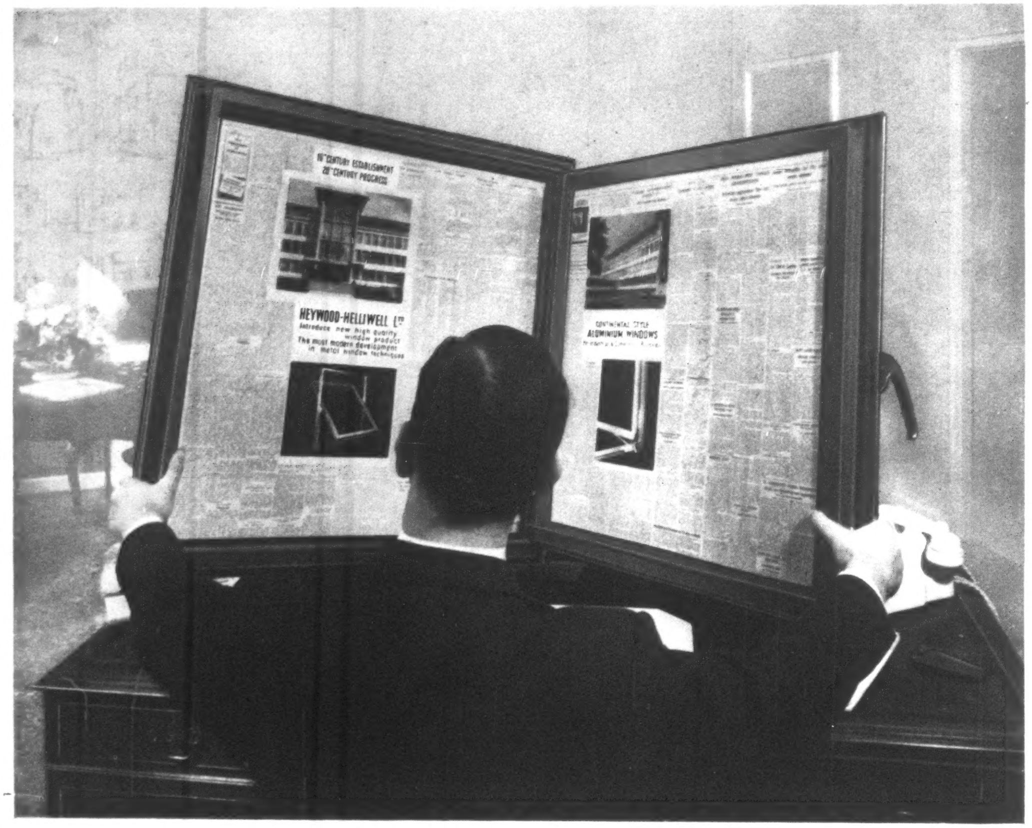

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The Continental style Aluminium Window

By

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only when it finds the ideal outlet.
Yet the right means of expression
may itself be a powerful stimulus.
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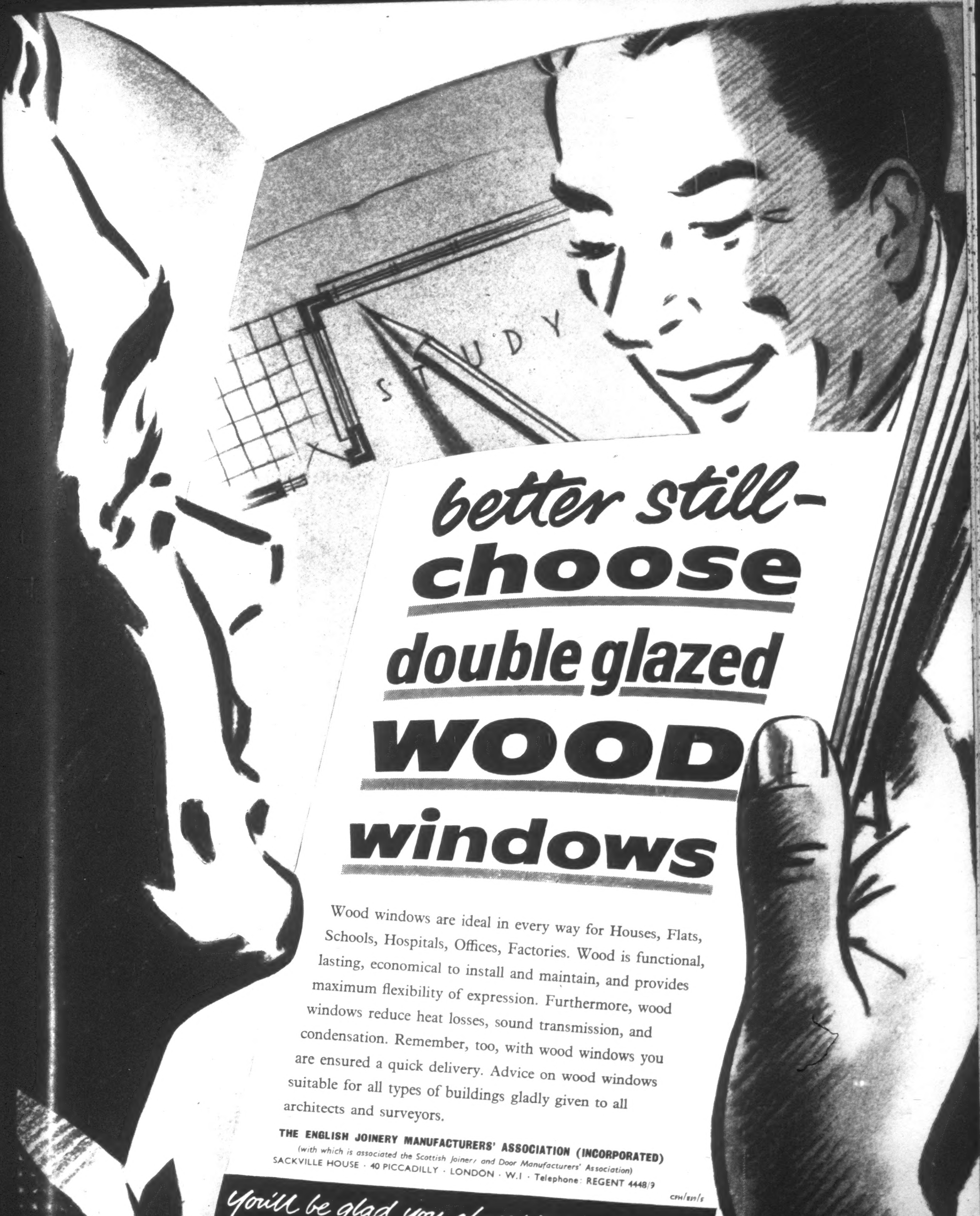

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This is an exceptionally high quality enamel for interior use. It gives a true 'eggshell' sheen with a toughness and durability that withstands frequent washing. Gaymel Eggshell Enamel has a semi-paste consistency and can be applied coat on coat – without a separate undercoat – by brush, roller or spray. It is available from stock in 36 intermixable colours selected from Gay's Architect's Range. For really top class results, with less time and labour, specify GAYMEL EGGSHELL ENAMEL, another sound paint by Gay's.

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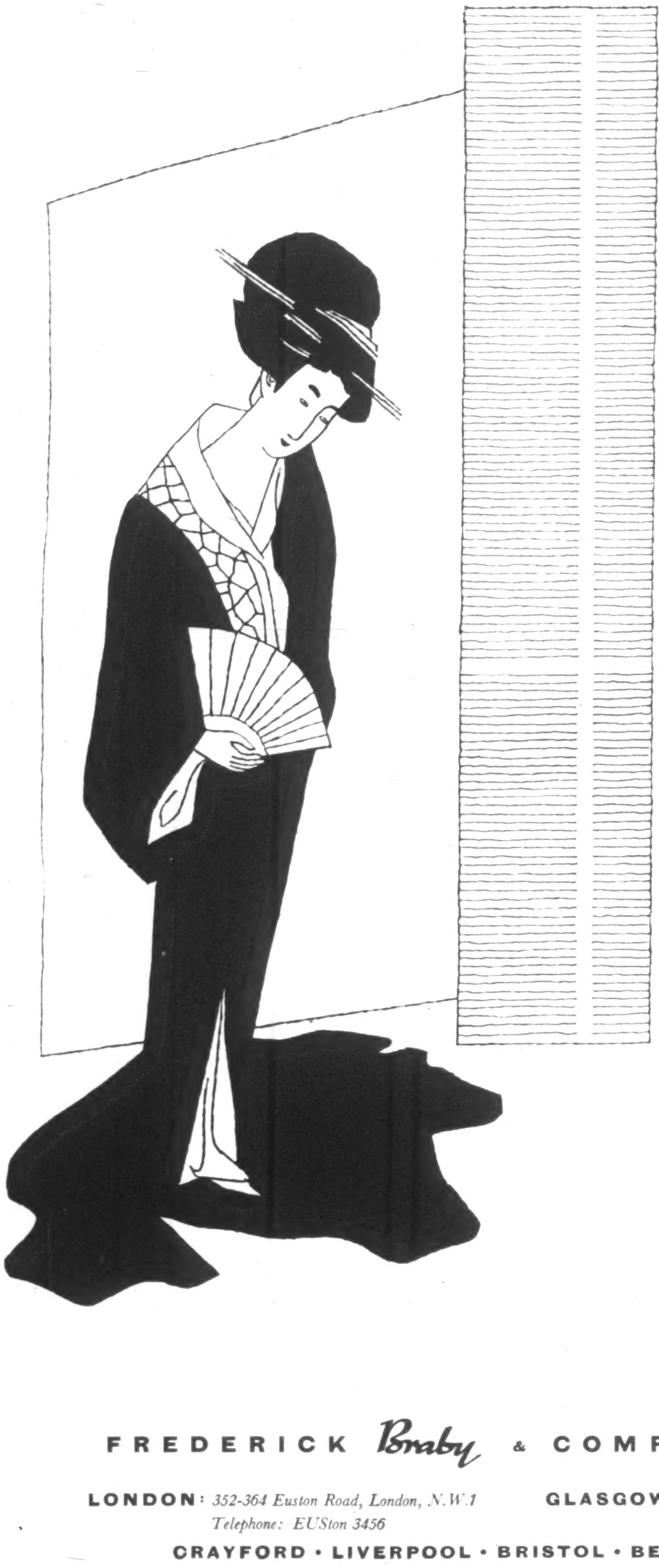

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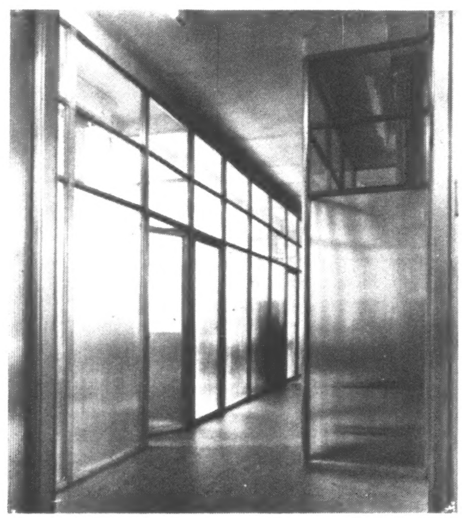
PARTITIONS

The east supplies the basic idea, but it takes western ingenuity to make a practical job of partitioning for industrial use. Braby construct their Bar-Form metal partitions of extruded aluminium alloy sections, with double dado panels (insulated) for offices, factories, hospitals and other buildings — excluding traditional Japanese houses.



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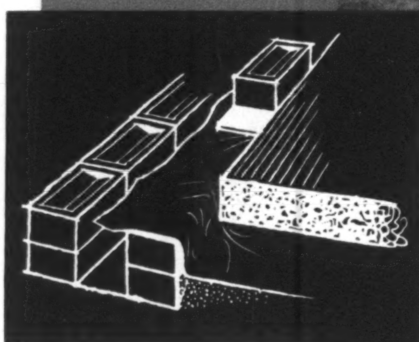
AP151

Leading contractors defy damp with 'Visqueen' oversite membranes



'Visqueen' 500 heavyweight, laid under the concrete ground floor rafts of a Wimpey house at Acklam, Middlesbrough. This estate is part of their national speculative house building programme.

George Wimpey and Co. Ltd. insure against rising damp and sulphate attack on their housing estates. They specify polythene sheeting as a damp-proof membrane.

First they put down a smooth concrete or sand blinding on the hardcore. Then the sheeting is quickly and easily unrolled. No adhesives or heat sealing are needed for the joints; just a simple "double welt" fold. The sheeting is incorporated with the d.p.c. (see diagram).

'Visqueen' building sheet is *cheaper* than conventional oversite damp-proofing materials. It also provides an effective seal against liquids and is an efficient water vapour barrier.

'Visqueen' is flexible, tough and chemically inert. Its acid resistant qualities ensure *lasting* protection for floor coverings and adhesives.

For full details, an illustrated brochure and the name of your local 'Visqueen' distributor, write now to :

BRITISH VISQUEEN LIMITED

SIX HILLS WAY, STEVENAGE. *A subsidiary company of Imperial Chemical Industries Limited*

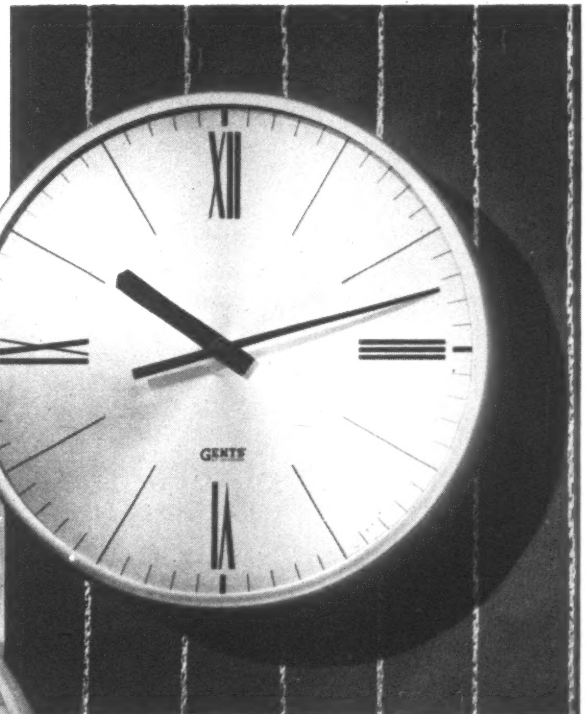
BV 140

Maximum legibility and good taste are combined in the Gents wall clocks shown here.

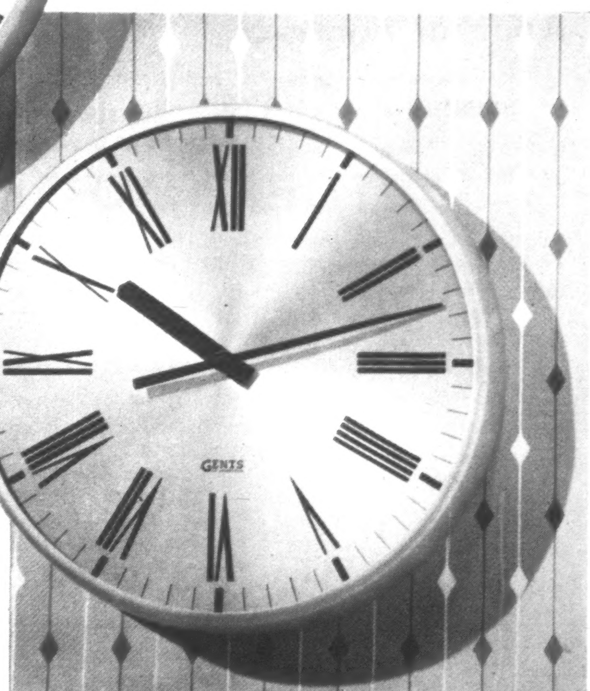
Styled by a leading industrial designer they provide a choice of standard models which fit happily into present-day surroundings and décor.

These and others in the extensive Gents range have been selected by the Council of Industrial Design for inclusion in Design Index.

All are available for operating either on A.C. Mains or as part of a Master Clock System.



In every way... Right!



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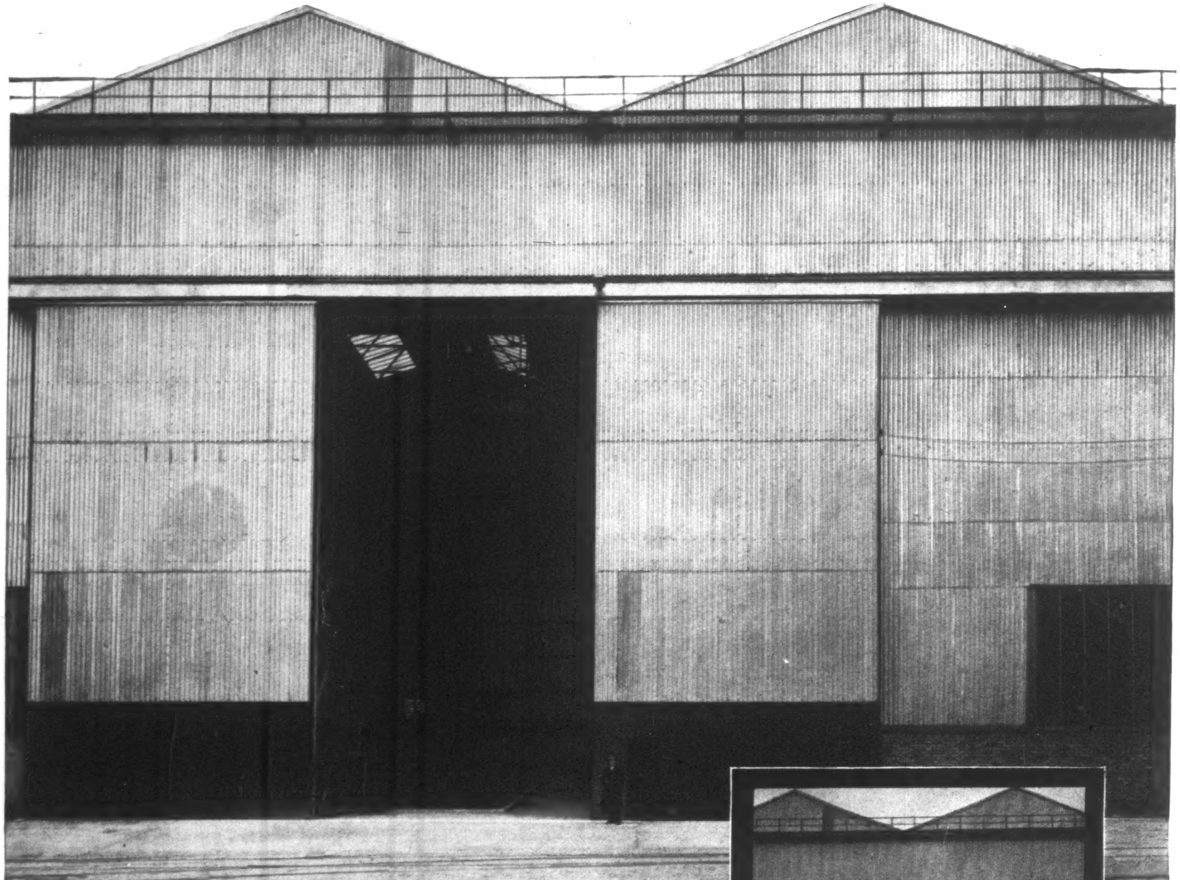

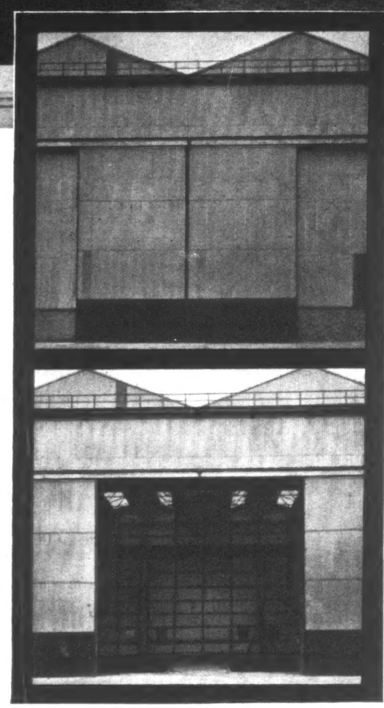

Another contract

for BOOTH STEEL DOORS

These large, electrically operated, steel doors were fabricated and fitted by BOOTH for Messrs. William Denny & Bros. Ltd. of Dumbarton. The opening is 47′ 3″ wide and 44′ 0″ high. Architects: Babtie, Shaw & Morton, Glasgow.

BOOTH have the facilities for fabricating and fitting all kinds of steel doors and rolling shutters — weatherproof and fireproof — for warehouses, factories, stores, transport depots, and any other buildings, which may have large or unusual openings.

BOOTH STEEL DOORS

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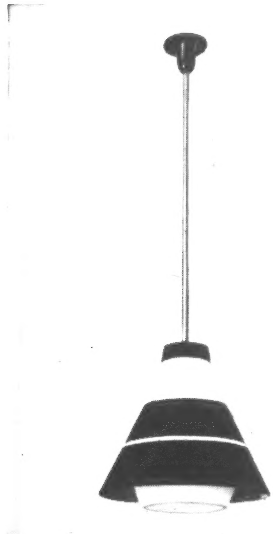
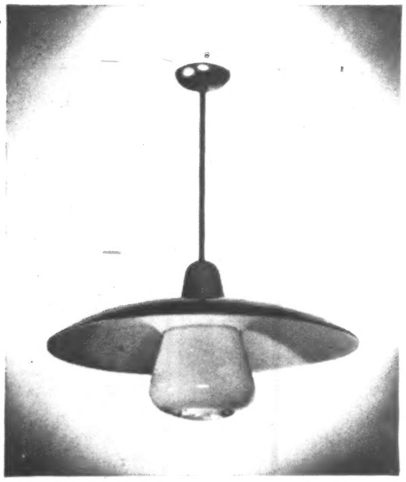
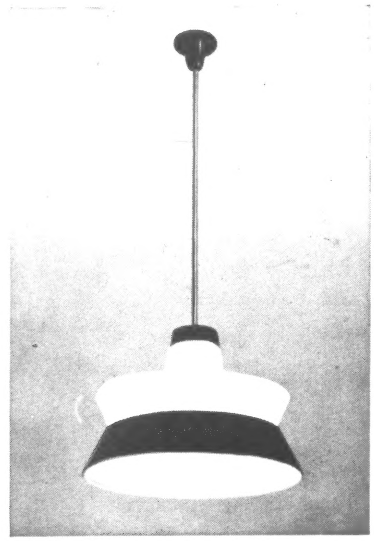


HERMES



SIRIUS



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FALKS MODERN FITTINGS

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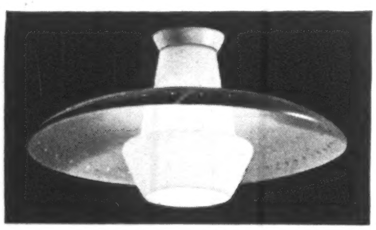
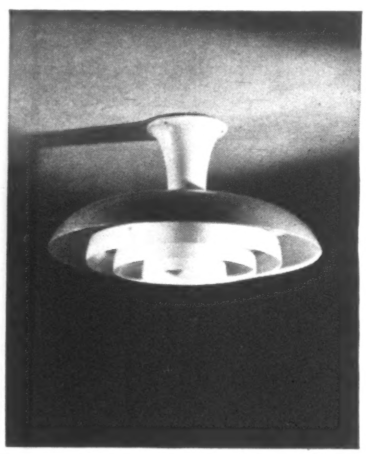


VEGA



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FALK, STADELMANN & CO. LTD

Designed by J. M. Barnicot M.S.I.A. of Falks

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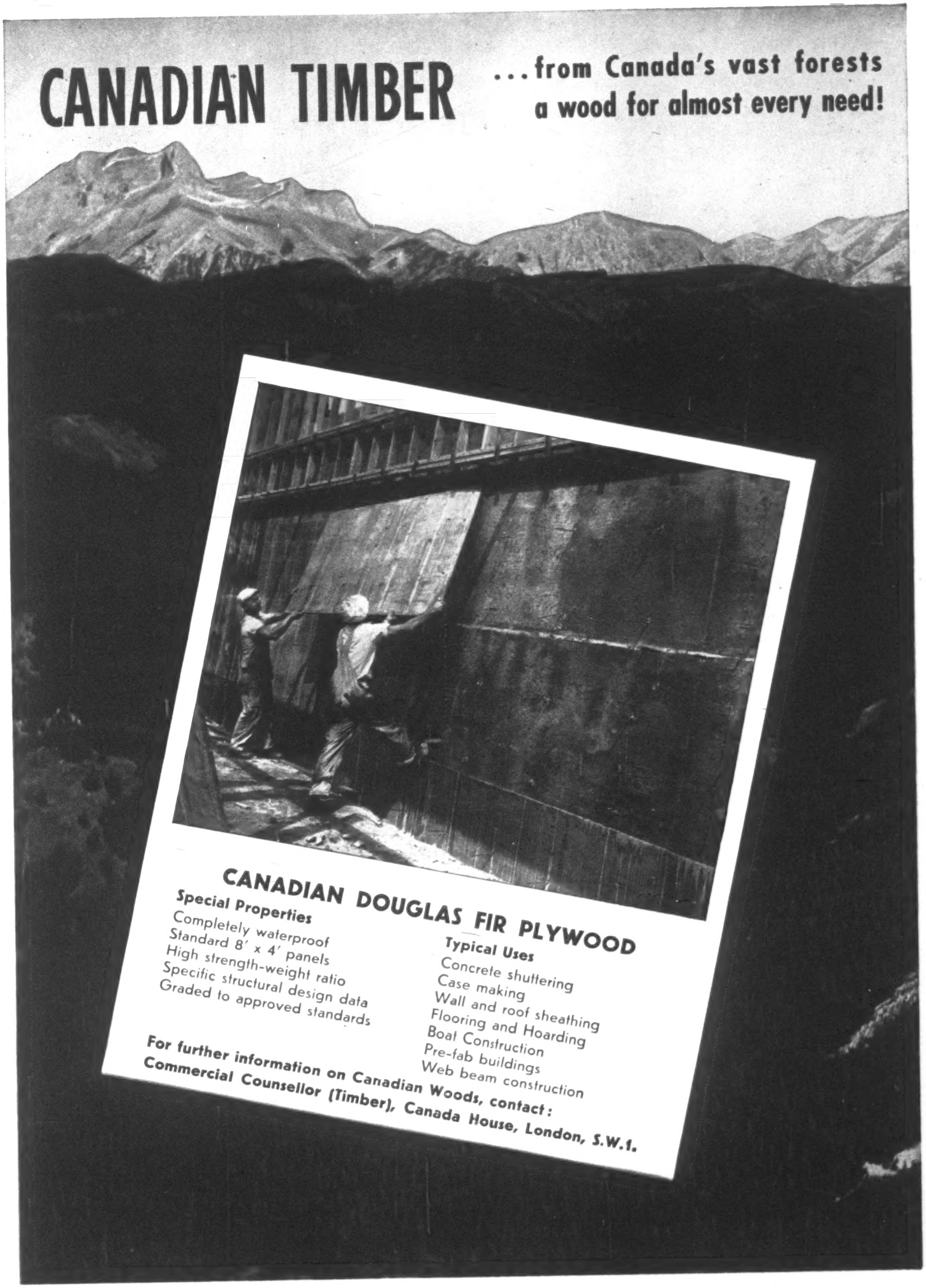
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a wood for almost every need!
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Completely waterproof
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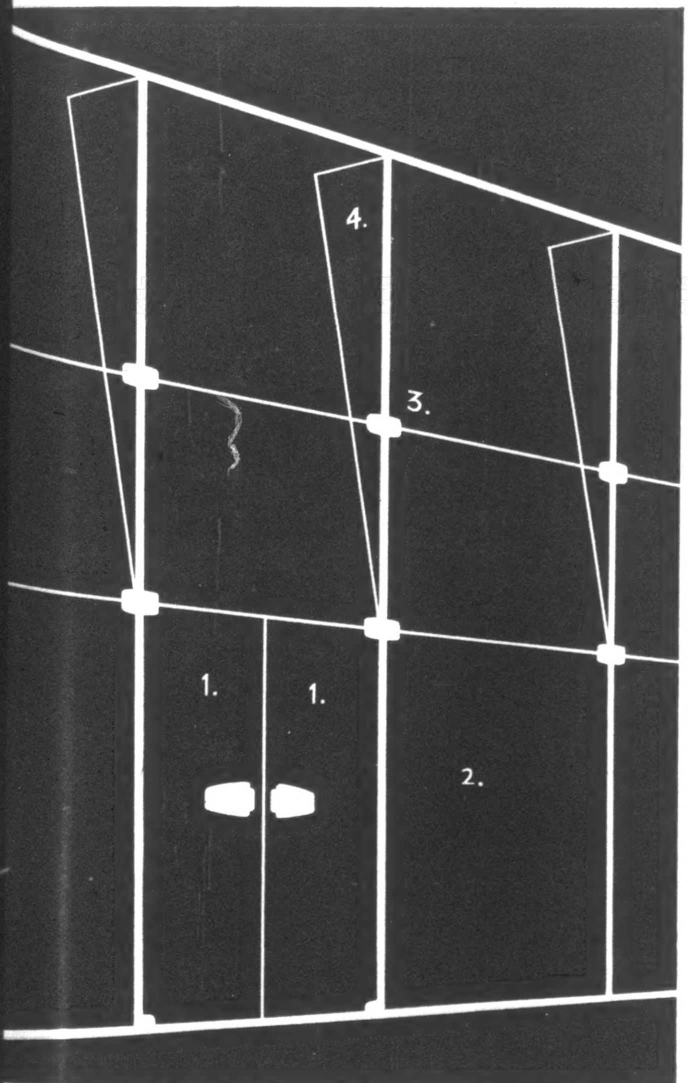
This showroom front, based on an idea by Edward D. Mills, F.R.I.B.A., exemplifies the opportunities for erecting imposing all-glass assemblies using Pilkingtons' "ARMOURPLATE" Glass Doors and Panels.

Expansive Elegance

Pilkingtons' "ARMOURPLATE" Glass Doors and Assemblies



Now, the inviting elegance of "ARMOURPLATE" Glass Doors can be expanded to include the whole frontage. For full details of Pilkingtons' "ARMOURPLATE" Glass Assemblies and fittings—which make possible uninterrupted expanses of glass, two storeys high—write to the manufacturers, Pilkington Brothers Limited.

1 Pilkingtons' "ARMOURPLATE" Glass Doors (guaranteed five years) are available in standard sizes up to 96″ x 36″. Non-standard sizes made to order

2 "ARMOURPLATE" Glass fixed panels and transoms are available in sizes up to 164″ x 60″.

3 "ARMOURPLATE" Assemblies require no metal framing. Small patch fittings link and secure the separate panels.

4 Rigidity is ensured by interior "ARMOURPLATE" Glass fins.

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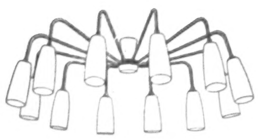
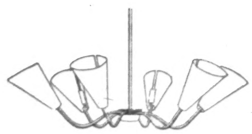
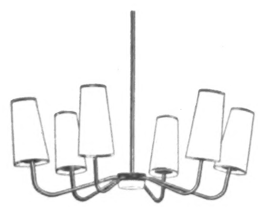
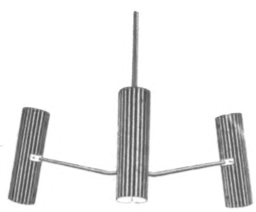
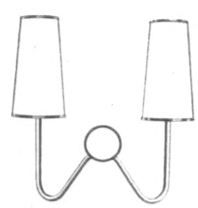
"ARMOURPLATE" is a registered trade mark of Pilkington Brothers Limited. Supplies are available through the usual trade channels.

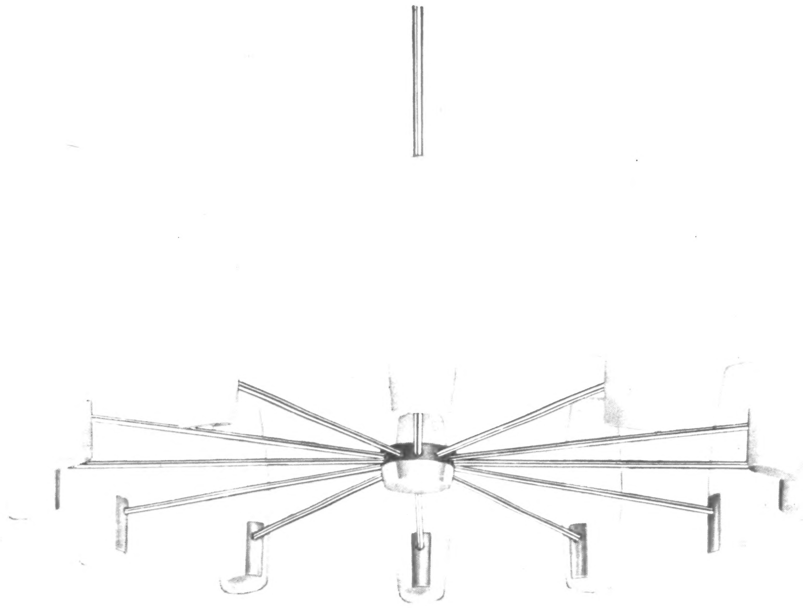


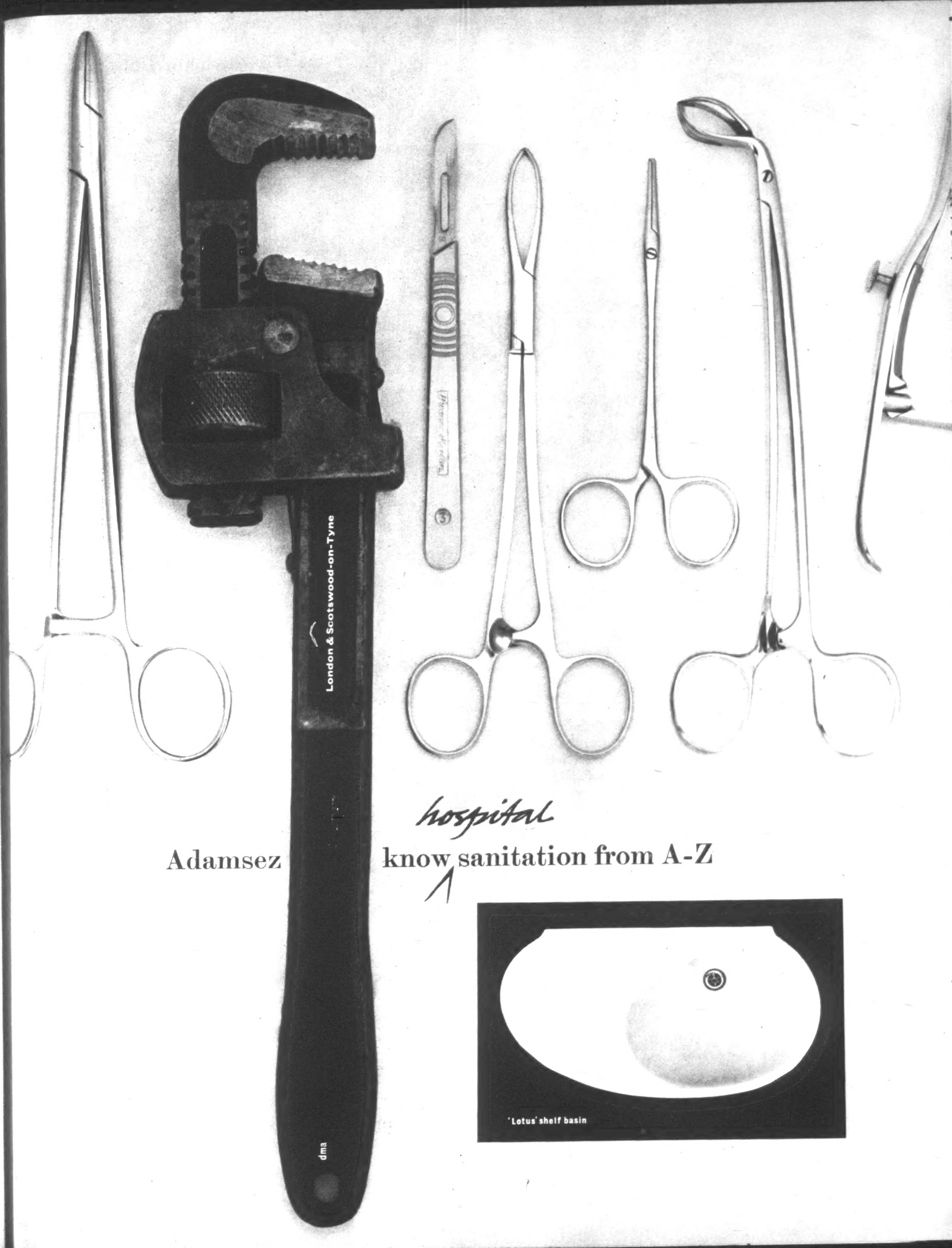











London & Scotswood-on-Tyne
Adamsez know hospital sanitation from A-Z
'Lotus' shelf basin
dma

To the architect and designer

ALCAN aluminium means:

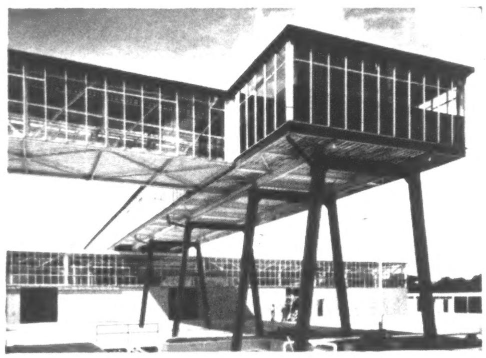
- *Freedom to design outside the limitations of traditional raw materials*
- *One-piece hollow extruded sections made to intricately designed shapes never possible before*
- *Windows opening up new horizons in planning and design but right down-to-earth in sheer practicality*

THE WILLIAMS & WILLIAMS LTD. *windows in the new head office of George Wimpey incorporate a special square tubular aluminium section housing strips of P.V.C. to reduce outside noise.*
Architect: E. V. Collins, A.R.I.B.A.

To the building owner or occupier

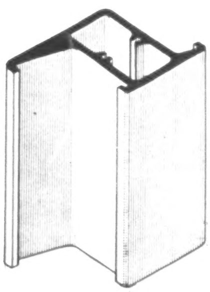
ALCAN aluminium means:

- *No painting necessary*
- *No rusting*
- *Resistance to decay and corrosion*
- *No warping*
- *No needless weight – windows that are* always *easy to open*
- *Reduced maintenance costs throughout the life of the building*



The can-making building of the new Wigan factory of H. J. Heinz & Co. Ltd. "Aluminex" Patent Glazing constructed of aluminium by WILLIAMS & WILLIAMS LTD. *was used.*
Architects: J. Douglass Mathews and Partners in association with Skidmore, Owings & Merrill.

The advantages of aluminium are at their greatest with ALCAN aluminium. ALCAN, one of the world's largest producers, are specialists in the ingot field. To manufacturers, ALCAN specialisation means a constant, reliable source of aluminium in alloy forms exactly – *consistently* – suited to precise needs.



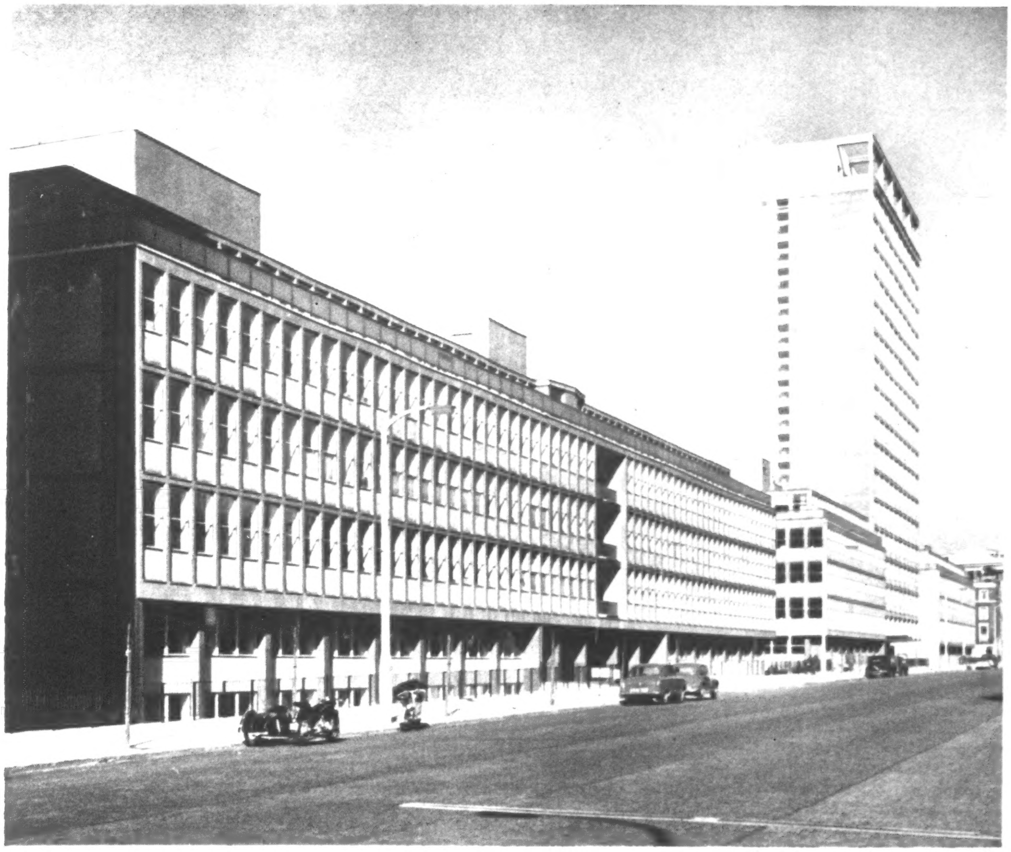
A typical example of an extrusion for aluminium window.

To architects and designers ALCAN specialisation makes available a vast store of technical knowledge and experience ready to be applied to any project, backed up by years of fabricating technique.

To the user of every aluminium product ALCAN specialisation means a certainty of quality and the best value that money can buy.

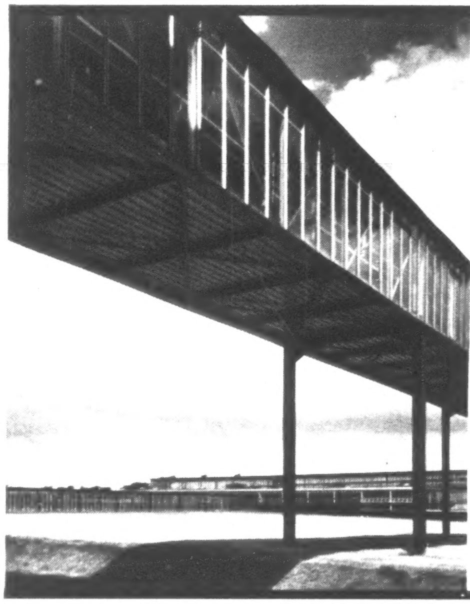
This bungalow at Tunbridge Wells incorporates WILLIAMS & WILLIAMS LTD. *new 'Alomega' aluminium windows which utilise a patent mechanism in place of cords.*

ALCAN (U.K.) LIMITED · Aluminium Canada House · 30 Berkeley Square · London W1



Manufacture starts on the upper level with unloading, storage, preparation and cooking. Products are then gravity fed to the lower level for can filling, sterilization, packing, warehousing and finally dispatch.

The presence of old coal mines underneath the site meant careful positioning of the component buildings. The can factory is therefore at some distance from the food production unit



WILLIAMS & WILLIAMS ALUMINEX SIDEWALL GLAZING HAS BEEN USED TO CLAD

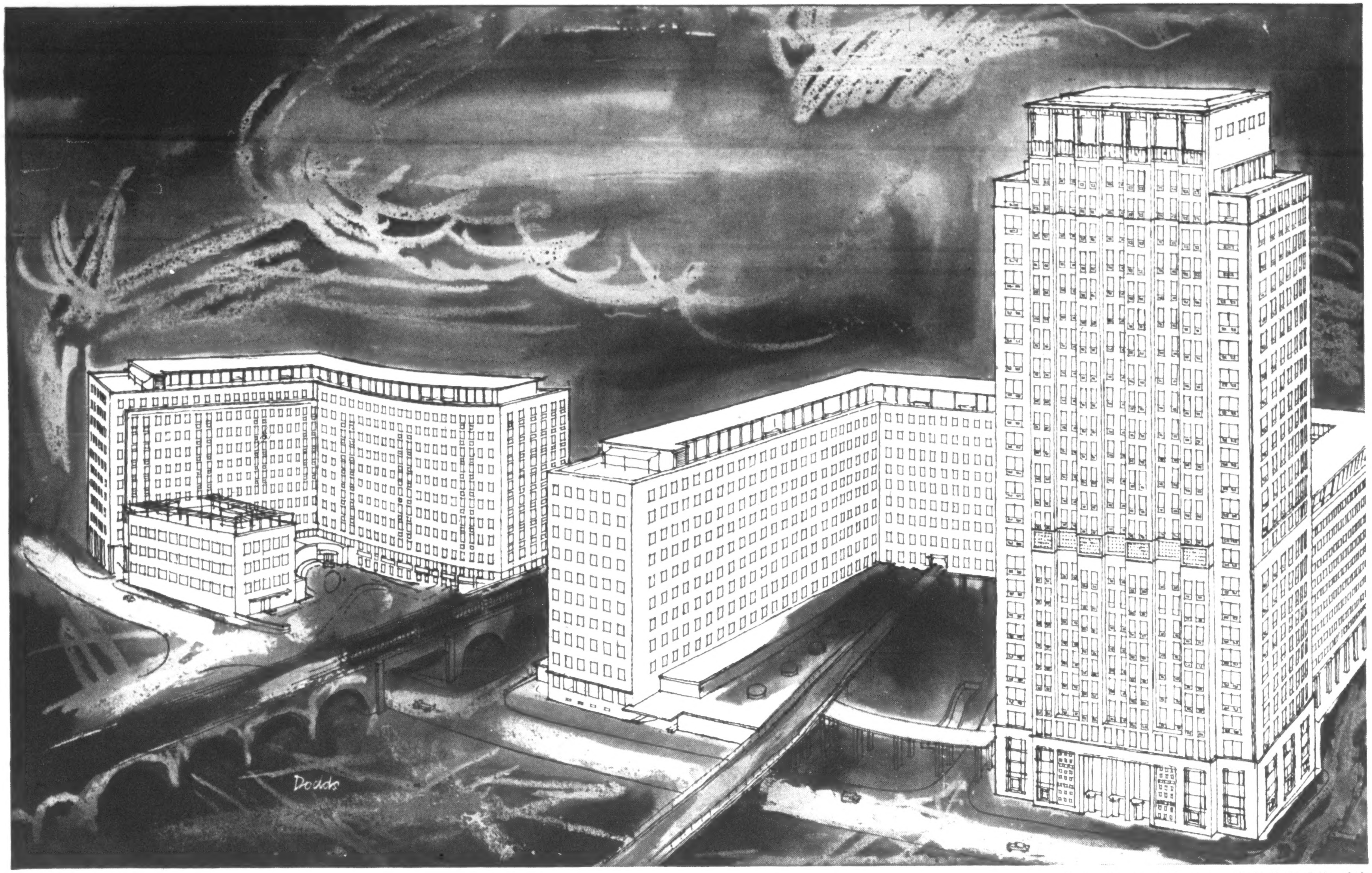
the service gantry which takes finished cans across to the main factory for filling

and the covered footway connecting the two factories.

and is linked to it by a service gantry which feeds the finished cans into the appropriate stage of production process.

forward looking building products **WILLIAMS & WILLIAMS**

Williams & Williams make steel windows of every description, ALOMEGA and other aluminium windows, movable steel and glass partitioning, ALUMINEX patent glazing, WALLSPAN curtain walling and many other products, all of which can be seen at our permanent window exhibition at No. 36, High Holborn, London, W.C.1.
WILLIAMS & WILLIAMS, RELIANCE WORKS, CHESTER · WILLIAMS HOUSE, 37-39 HIGH HOLBORN, LONDON, W.C.1



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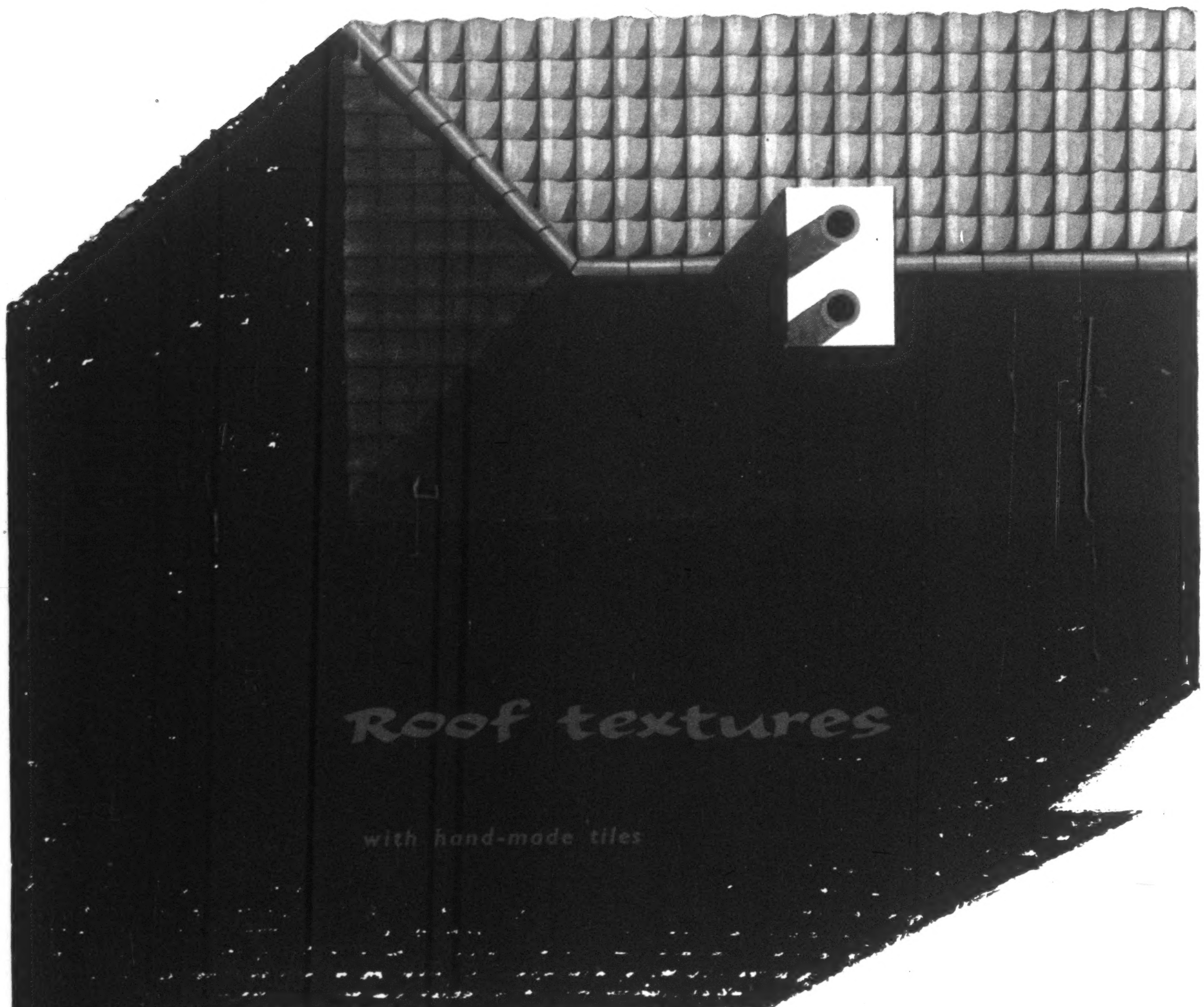

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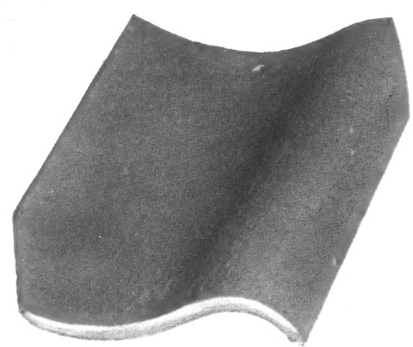

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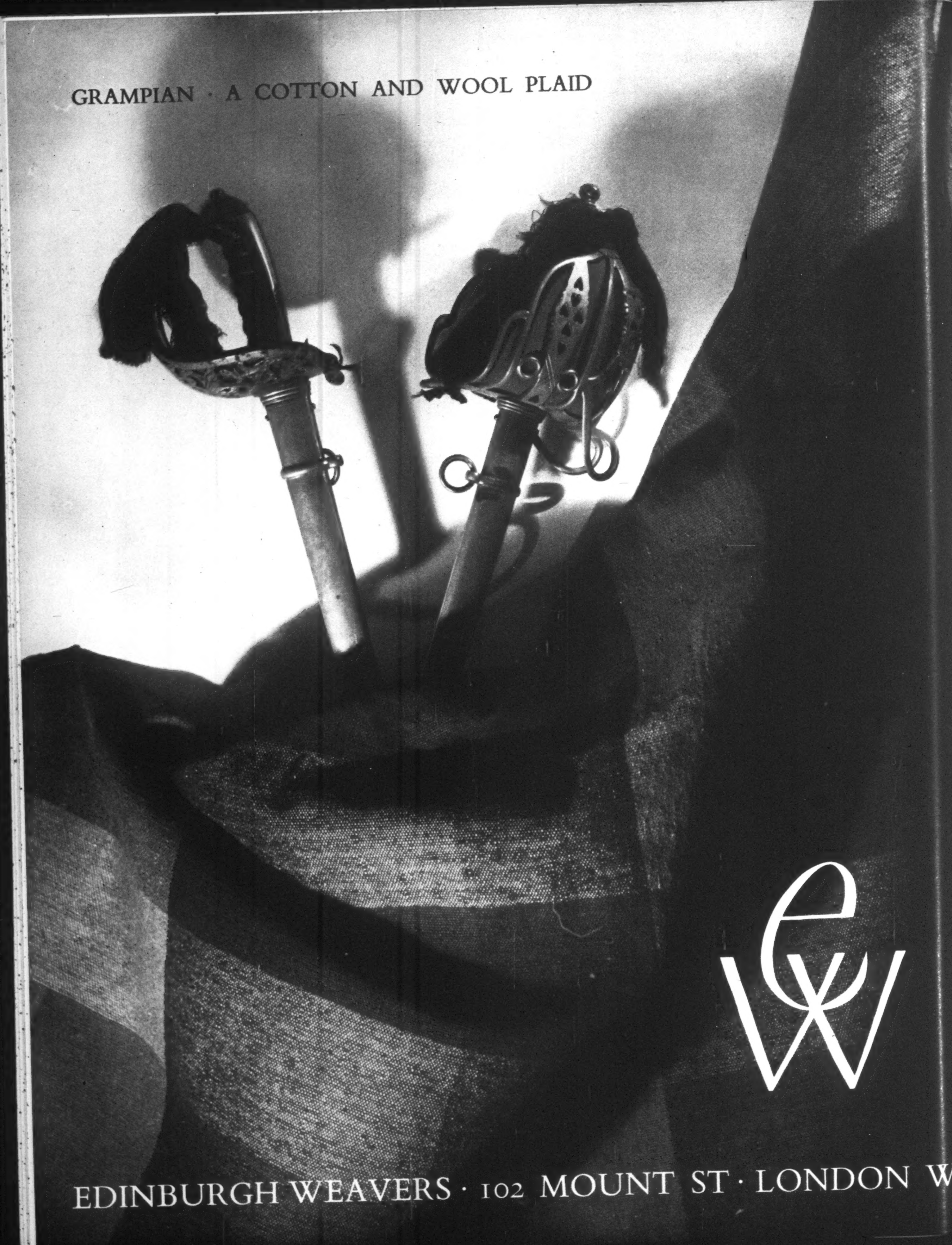
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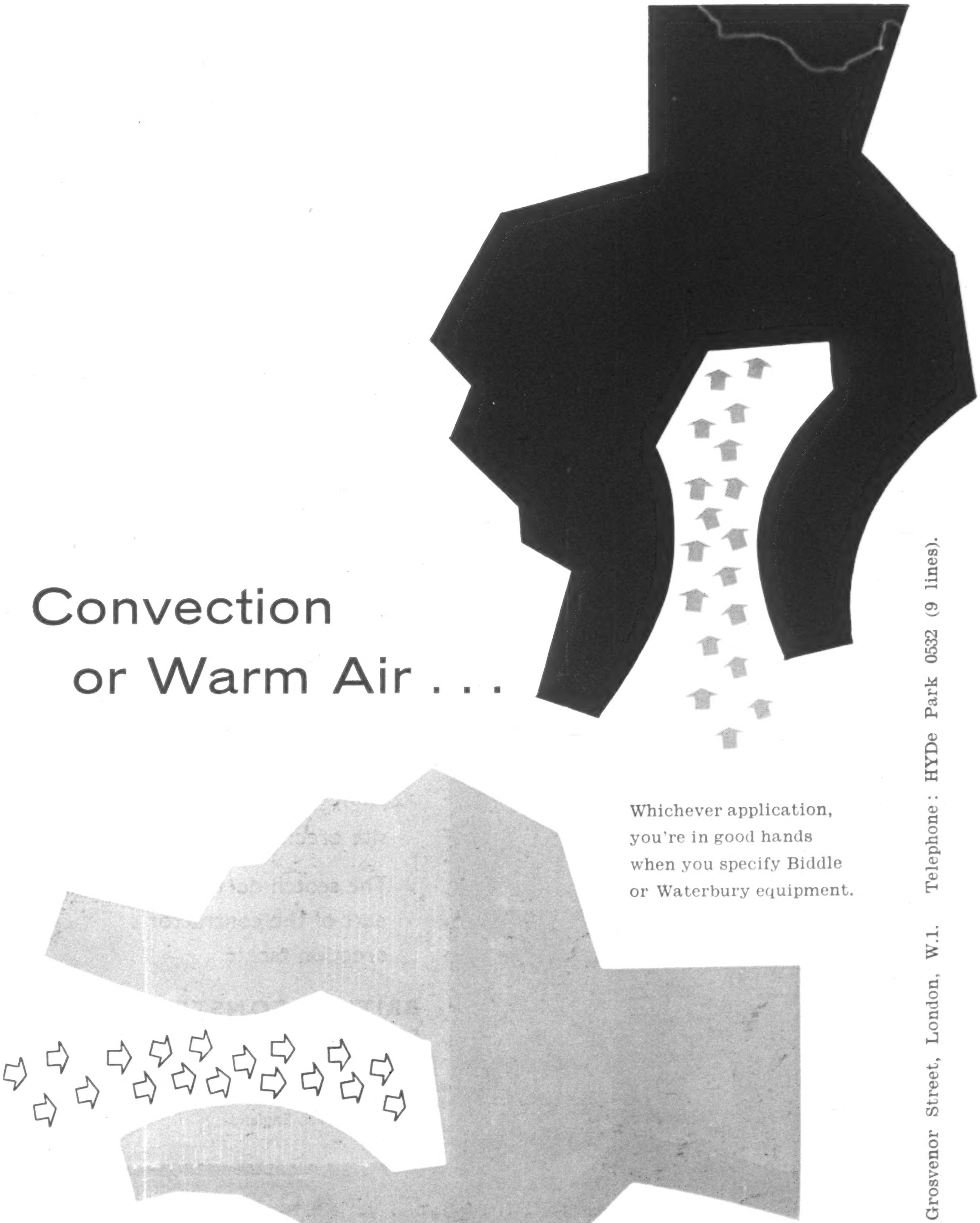

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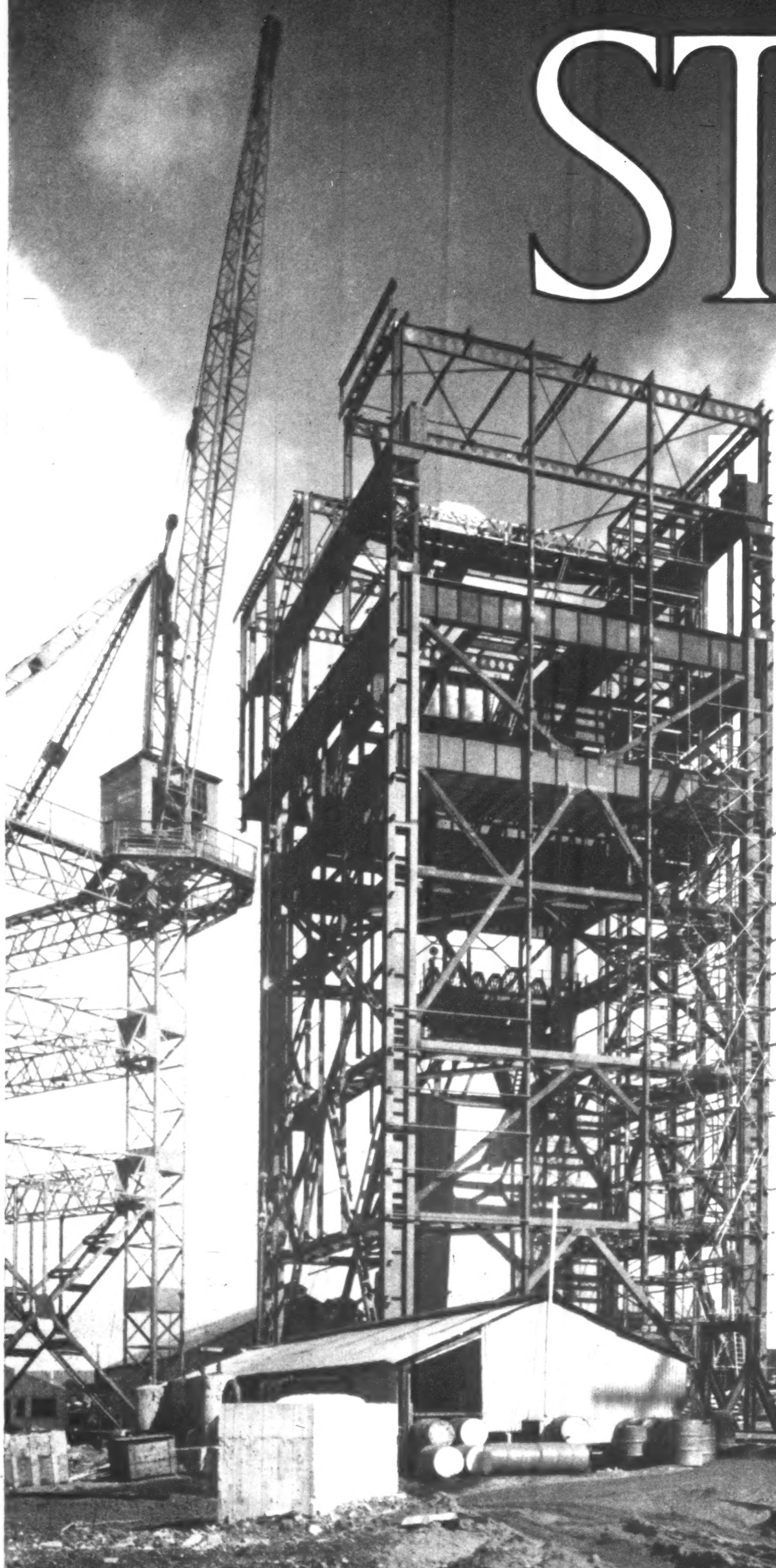

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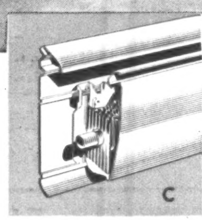

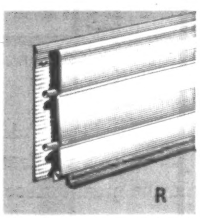

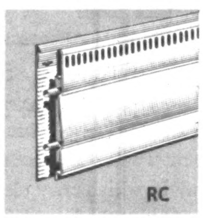

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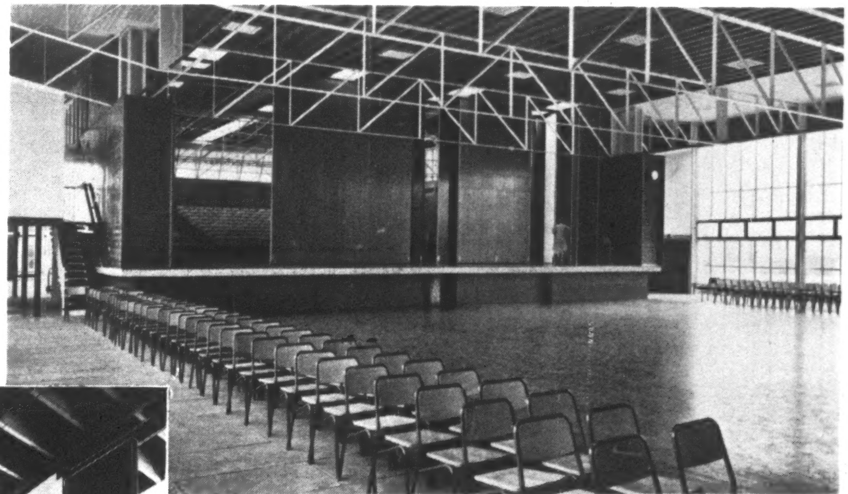

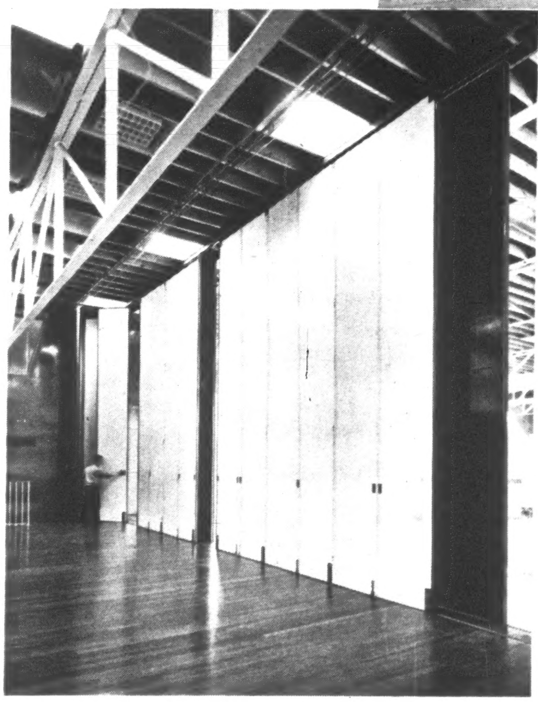

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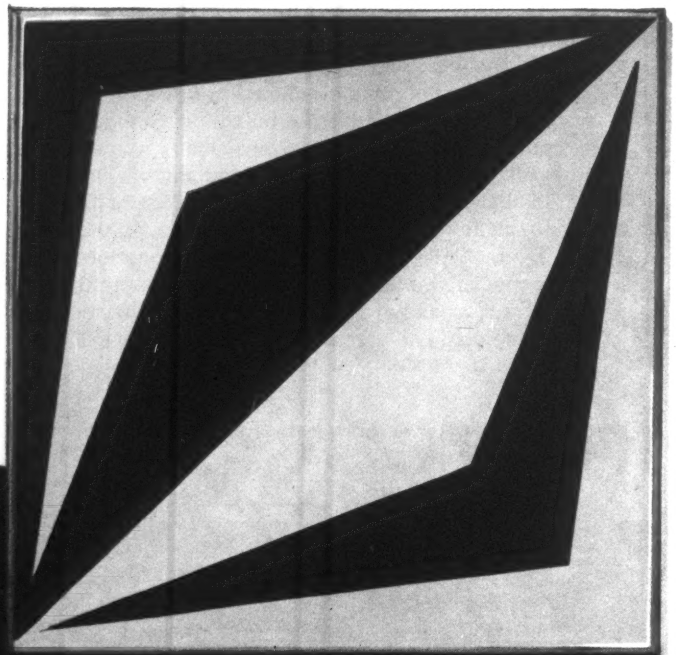
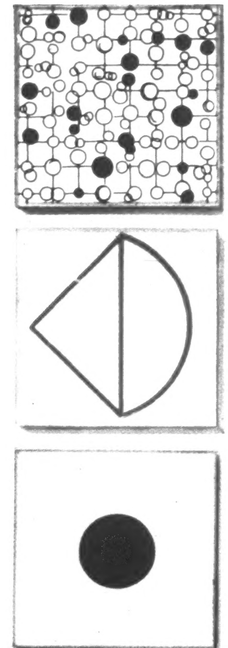
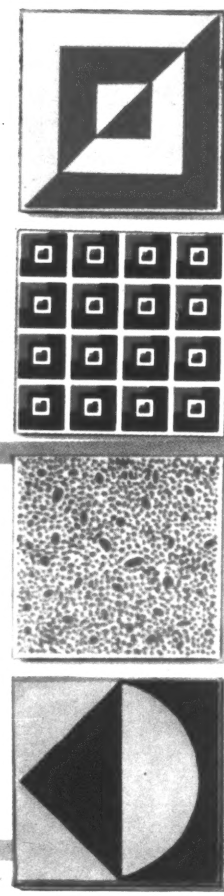




Plan with PILKINGTON'S tiles



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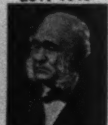

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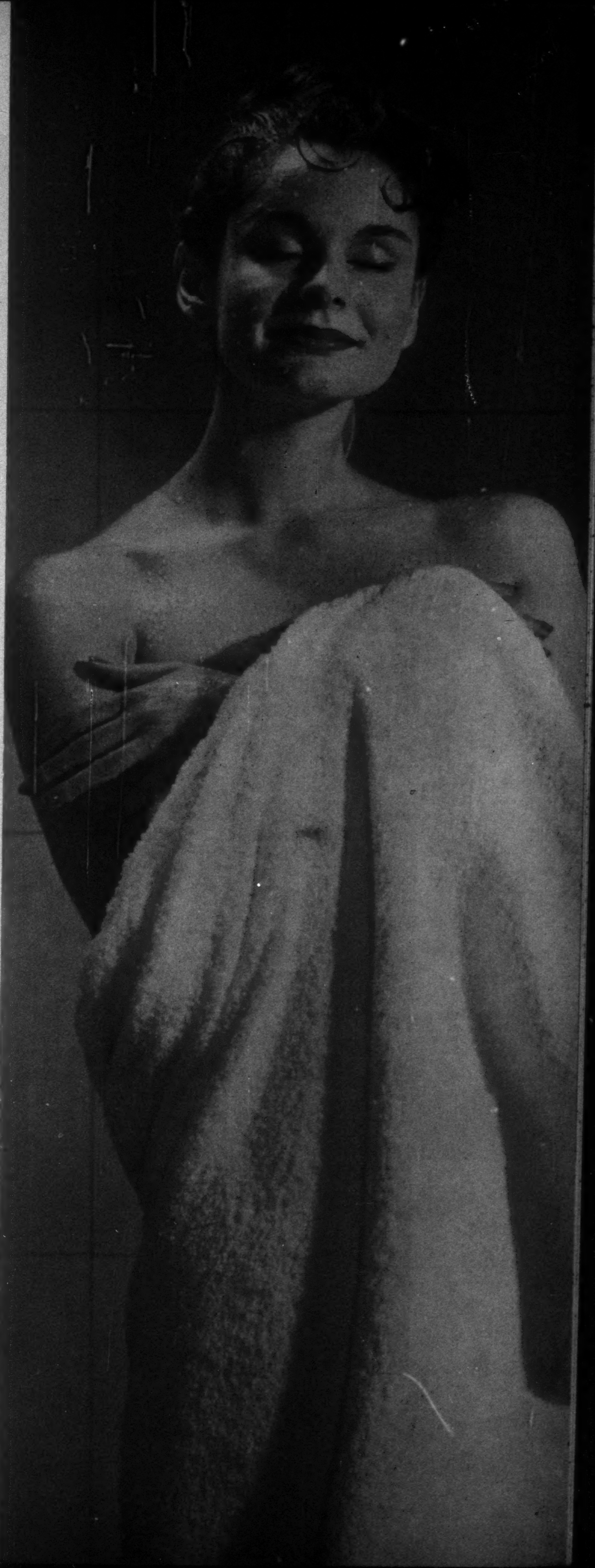

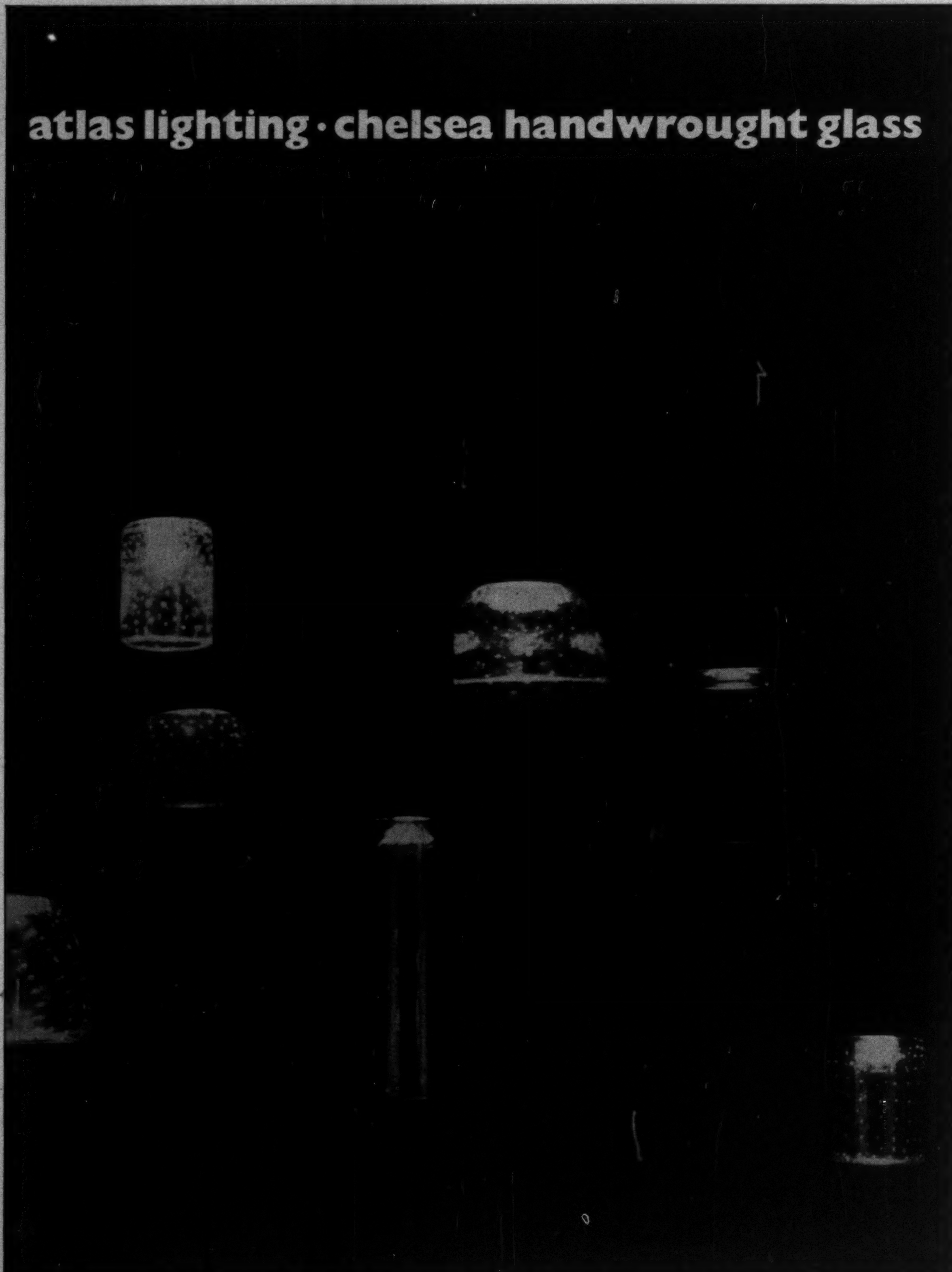

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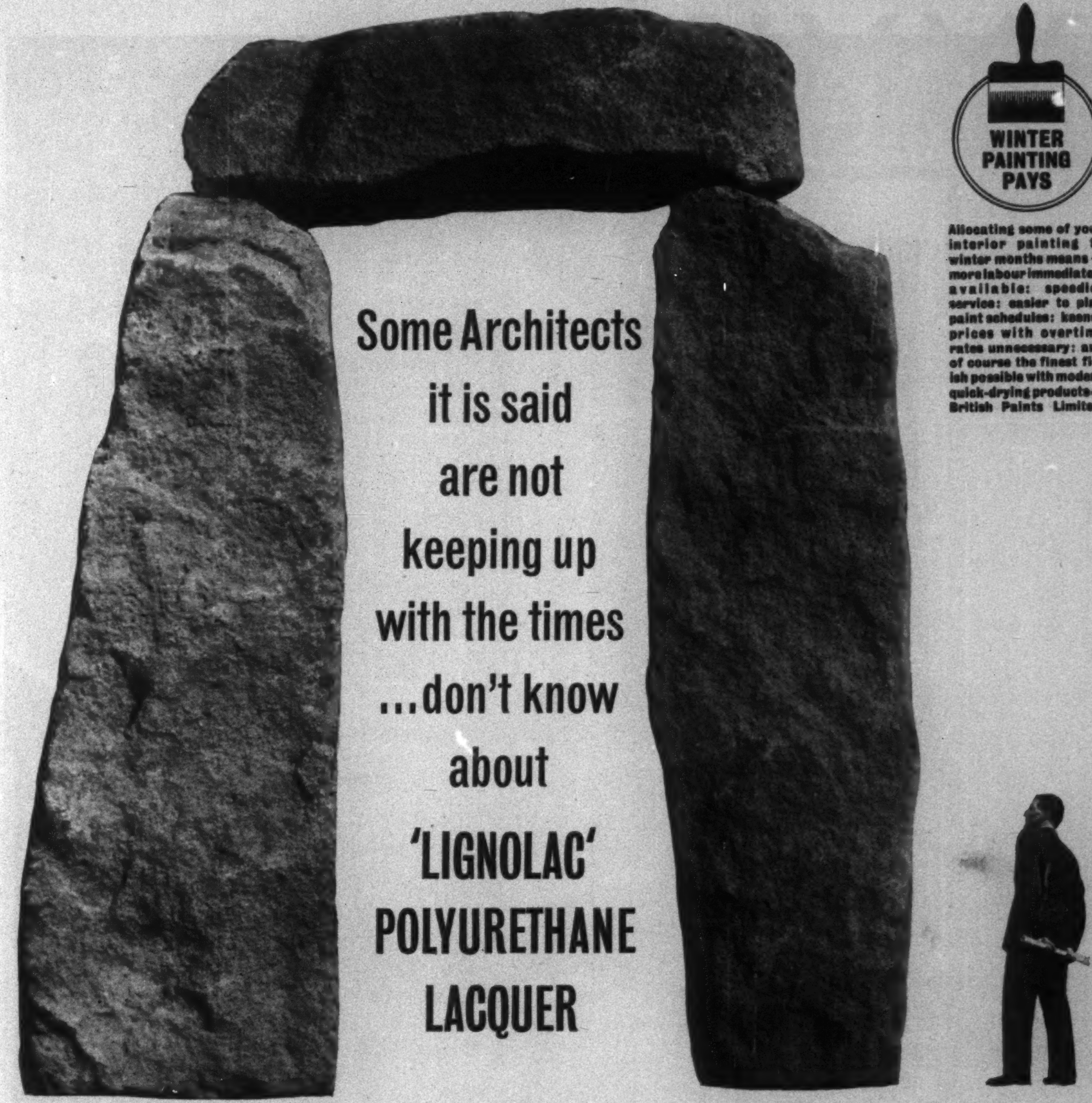

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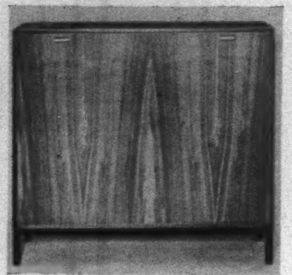

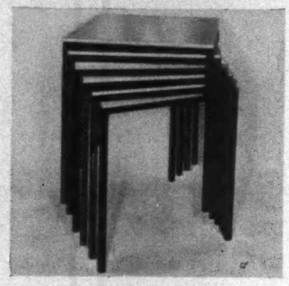

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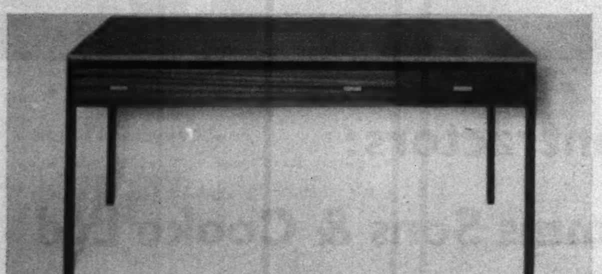

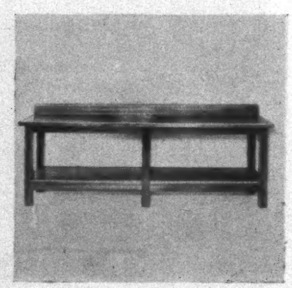

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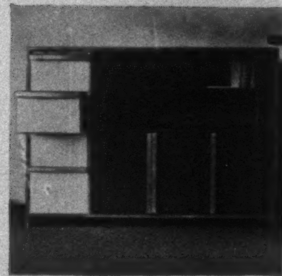

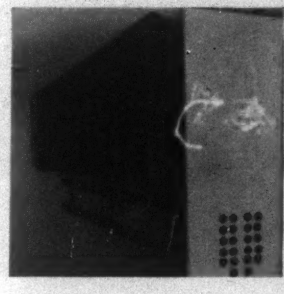

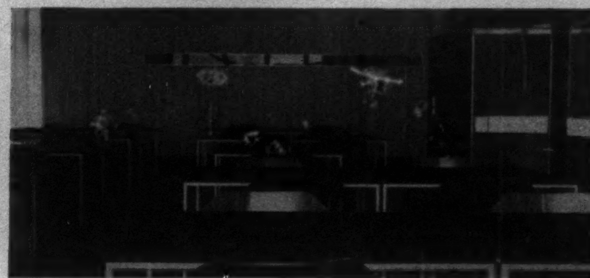

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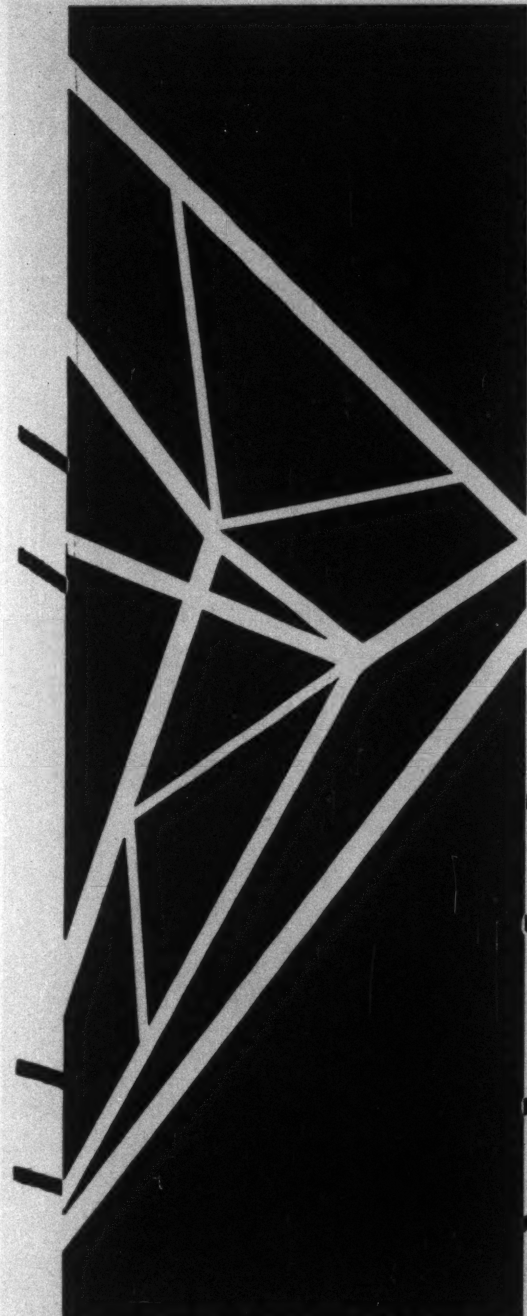

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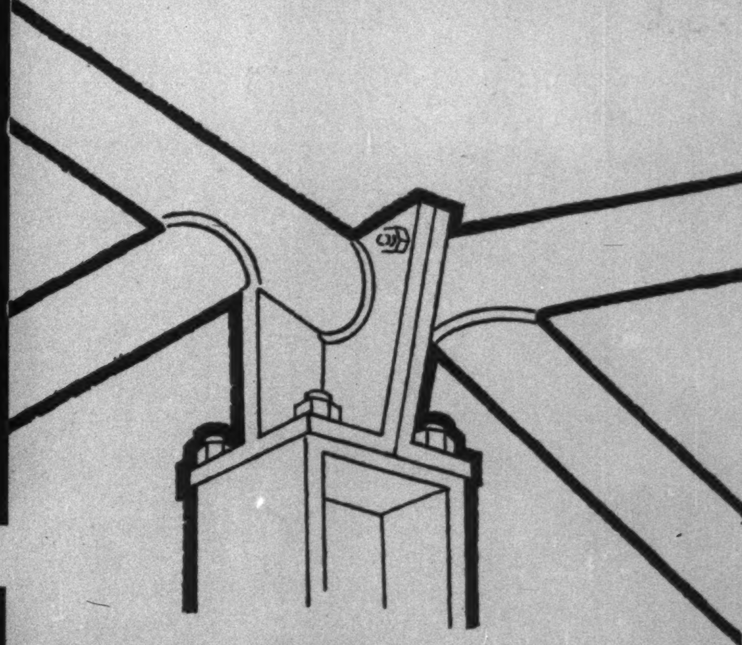

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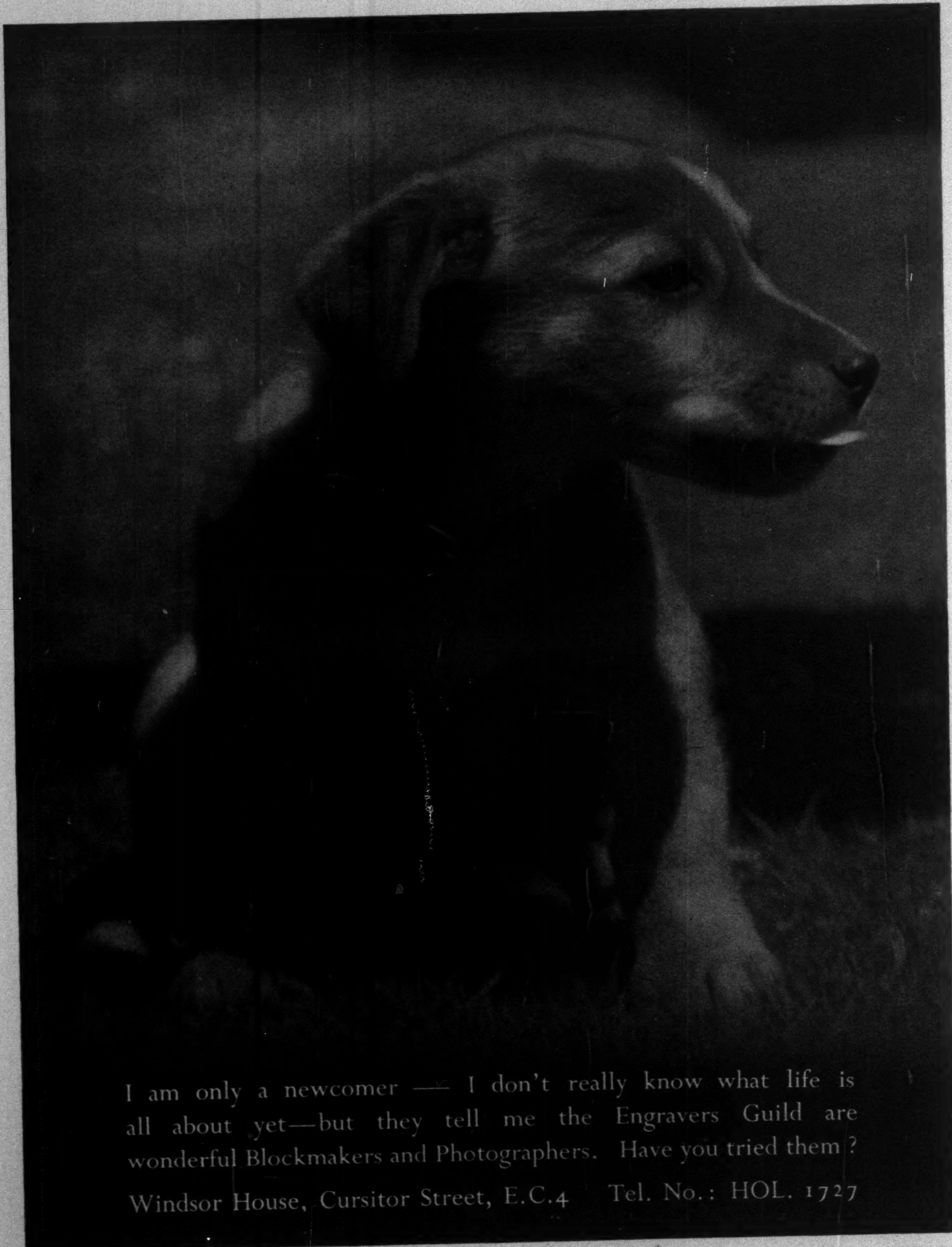
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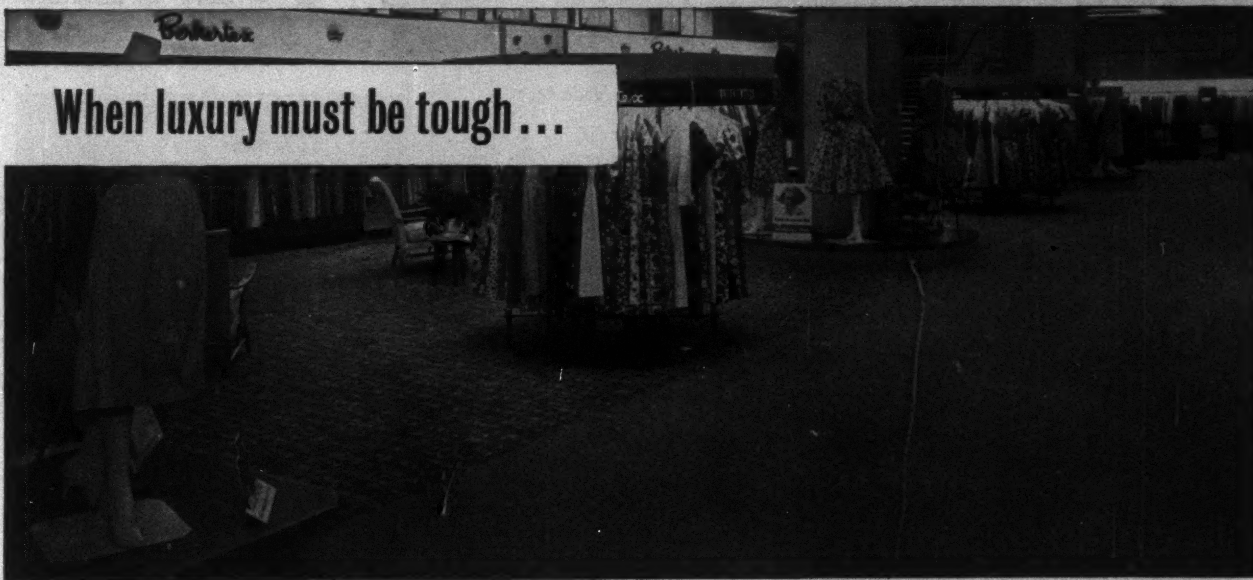

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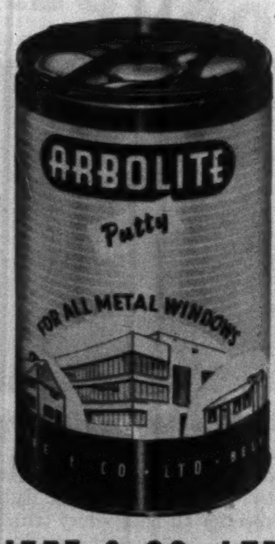

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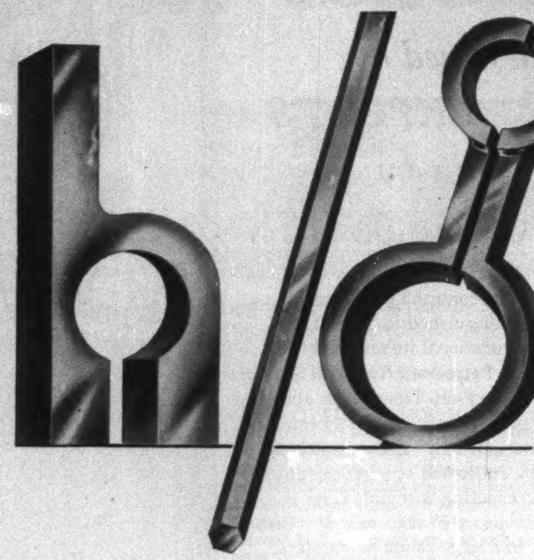

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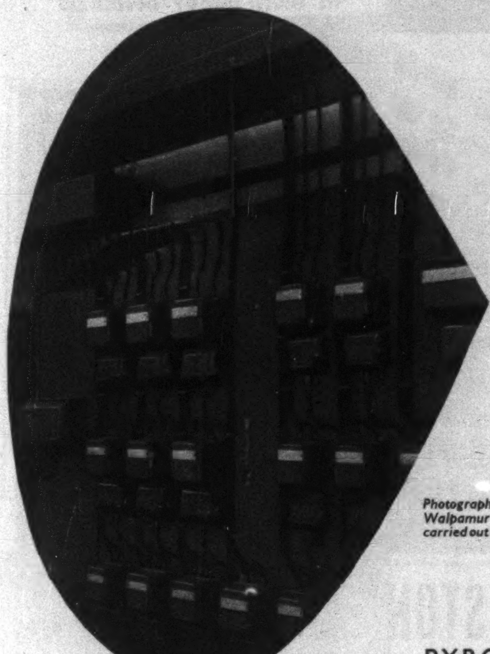

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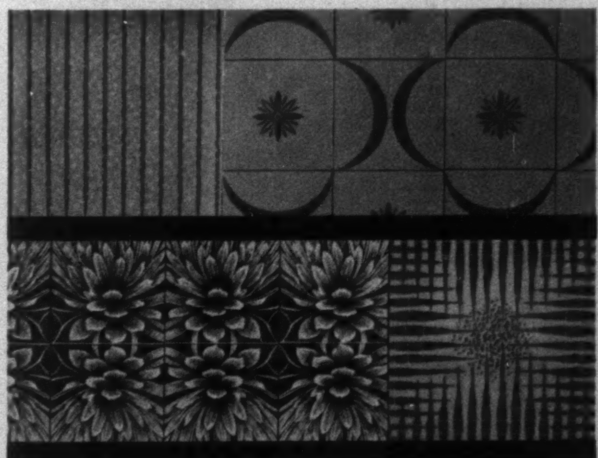

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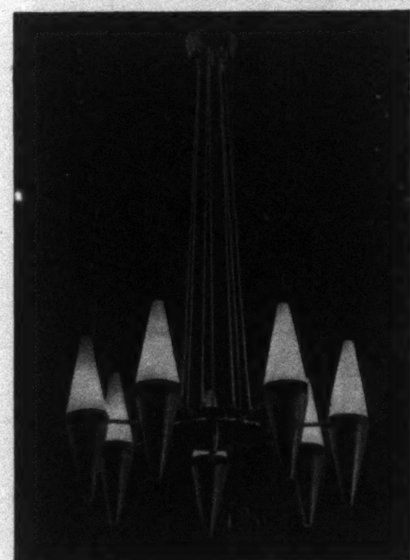

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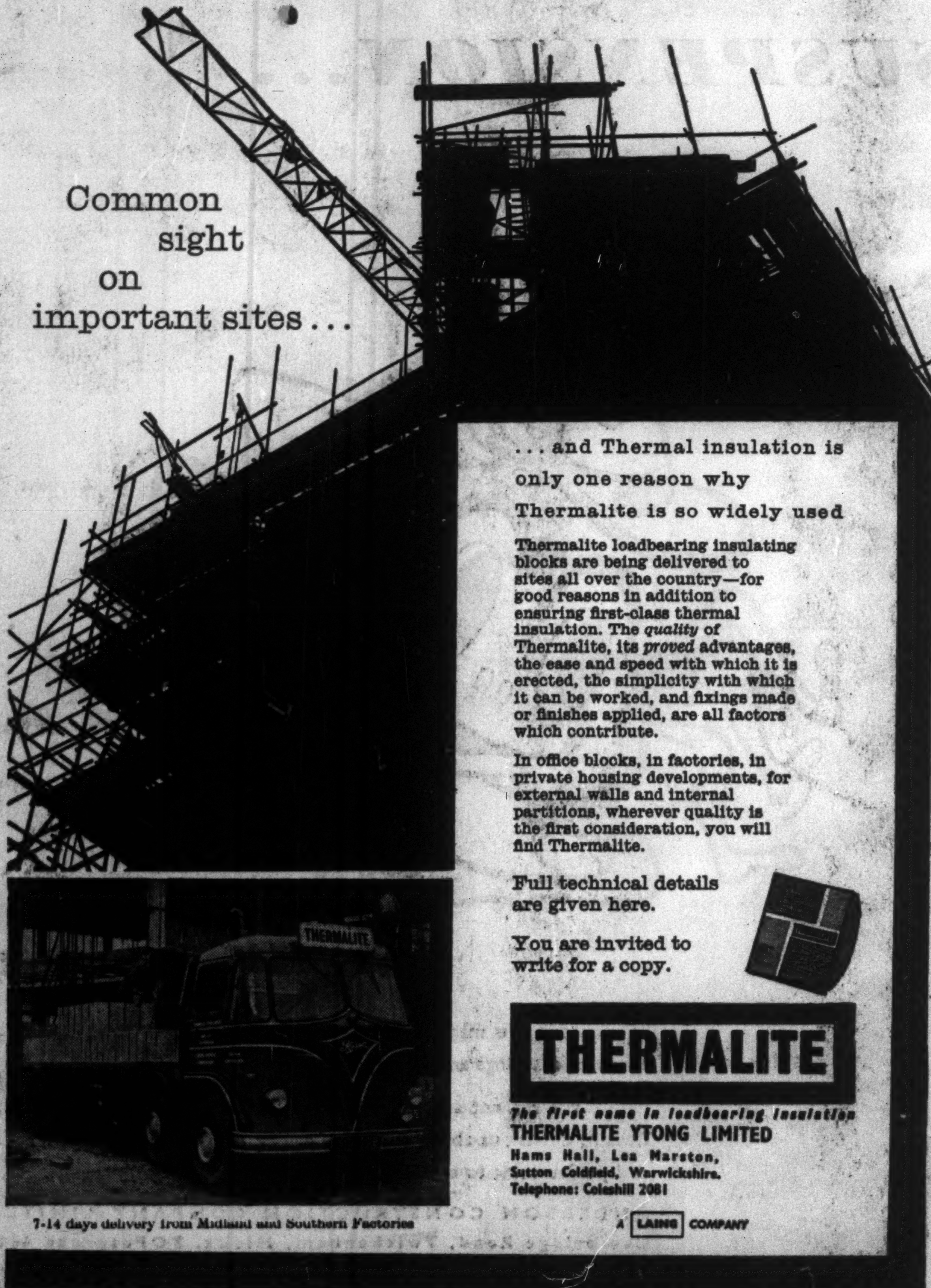
Entered in the New York Post Office as Second Class Matter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